COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices

© 1974 by Computerworld, Inc.
ear August 14, 1974 Vol. VIII, No. 33

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NEWSPAPER

NEWS IN BRIEF

Swedish Data Act Begins License Rules

STOCKHOLM – The licensing and penalties provision of the landmark Swedish Data Act [CW, Sept. 19, 1973] went into effect this month, requiring that all personal data systems here be licensed by a Data Inspection Board.

Permits will be issued "unless there is reason to anticipate undue encroachment on the privacy of recorded persons." They will be issued after the board considers the character and volume of the personal data and the "attitude that prevails among such individuals as may be recorded," according to the Swedish government.

Except for associations' own membership files, no records may be kept on the political or religious views of persons, and crime, health and welfare files may be kept only if authorized by statute.

Although the act was passed in May 1973 and the Data Inspection Board was established a year ago, the licensing and penalties provisions generally became effective July 1.

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Surveillance System Eyes White House Tape Vault

WASHINGTON, D.C. – While Congress is busy listening to the President's Watergate tapes, a computer is silently watching the White House tape vault.

Before all the current interest in them was generated, the tapes were simply bound up in cheap wrapping paper and left stacked in White House offices of the Secret Service, *Newsweek* magazine reported.

However, Maj. Gen. John Bennett, who was subsequently chosen to protect the tapes, installed a computerized surveillance system. The tapes are now stored in three locked vaults and electronic sensors constantly scan the tapes and vaults, automatically reporting any incursion to a computer, the *Newsweek* article said.

Further details on the system are confidential, according to a White House spokesman, and cannot be disclosed.

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Ifip Keynoter Claims

DP Power Demands Social Conscience

By Ronald A. Frank
Of the CW Staff

STOCKHOLM – One of the most vexing problems facing all countries is whether the power concentration created by computers can be made socially responsible, the keynoter claimed at the opening session of Ifip Congress '74 here last week.

Speaking to an audience of around 4,000 attendees drawn from 50 countries, Madame Alva Myrdal, former Swedish cabinet minister, called attention to the relation of the computer to science, power and society.

The triennial event, sponsored by the International Federation for Information Processing (Ifip), was formally opened here by King Carl XVI Gustav of Sweden, before the Myrdal keynote.

Using two examples of good and potentially evil applications of computer power, Myrdal said the international world weather forecasting network exists without the danger of misuse of the power of the accumulated knowledge, citing this as a "glorious example" of what can be done with DP power.

Striking a more ominous note, Myrdal called attention to the military capabilities of the U.S. and Russia and said the computerized knowledge accumulated on both sides has not been pooled, but used instead primarily for the military interests of both nations.

With regard to finding a solution for the military abuse of computer power, the speaker suggested a future conference should deal with computers and the international balance of power.

'Wide Open' Data

For society as a whole it is important that information of concern to social matters "should be laid wide open," the former government official said.

"I have learned enough about the disastrous blunders caused by secretiveness" of data, she added.

The Swedish value on openness of data as a cultural trait, together with the concern for shielding the integrity of the individual, led to the establishment of Sweden's law on privacy, she told the congress attendees.

Three social factors have become "par-

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Medical Field Ill-Prepared For First DP Encounters

By Ronald A. Frank
Of the CW Staff

STOCKHOLM – The medical care field was not well enough prepared to enter the age of data processing and as a result was taken by surprise when computers were first applied to hospital problems, according to Dr. A. Gronwall, president of the International Hospital Federation.

Keynoting Medinfo '74 here last week, the first international conference on medical data processing, he charged that in many cases DP systems were "introduced insecurely and unsystematically." Often the computer technique "steered the development of information systems instead of being a tool for existing systems," he noted.

Breaking the "Medinfo" area into two sections, the speaker said the administrative section had fared better than the medical section, which had no solid basis for DP development because it lacked logically constructed systems.

Medical systems have not been properly analyzed with respect to the true value of information at the patient's point of contact, Gronwall said, and the patient's point of contact with the system has not yet been analyzed.

"We started at the wrong time by introducing electronic data processing before the systems had been defined," he said.

The interest was focused too much on the possibilities of the computer technique. This was not the correct strategy, Gronwall said. He called for an examination of the "whole patient care system with respect to the application of modern electronic data processing," but without getting "intoxicated by its great possibilities."

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Commerce Report Warns

Power Variations Could Be Costly

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Disturbances in electrical power supplies could cost computer users as much as $100,000 to $150,000 a year depending on the size of the installation, according to a report recently issued by the Department of Commerce.

"Costs include such expenses as repairing or replacing equipment, and debugging and rerunning programs," the study explained, but added these totals frequently don't take into account such costs as overtime salaries, missed production schedules or lost sales due to an inoperative system.

Designed to make users aware of the need to examine the quality of electrical power they receive, the study detailed several effects any variations in this quality might have on the proper functioning of their equipment.

Even before the energy crisis, steady state voltage requirements for computers of 120/208 volts ± 10% – with many IBM machines requiring +10% or -8% – were endangered by voltage drops along the line between the service entrance of a building and the equipment connections, the report noted.

Large loads coming on line were found to be capable of driving the voltage down 20% or more for 30 msec, exceeding the average computer's tolerance of a 20%

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Automation: Worker's Helpmate or Pink Slip?

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Although automation may offer a potential for making work more pleasurable by eliminating its hazards or tedium, public policymakers have met a wall of opposition from people who fear it will eliminate their work altogether.

Automation conjures up negative attitudes because "we've seen automation badly mismanaged," Ruth Davis told attendees at a recent automation technology conference here.

Davis, the director of the National Bureau of Standards' Institute for Computer Sciences and Technology, explained, "Technology is neutral. The user and the public have the same rights and prerogatives in determining the end use of technology as its developers," although those rights have been little exercised to date.

She noted the word "automation," coined in the 1940s, has been expanded in scope to include the use of machines and devices "to assist, as well as to replace," human control functions.

"There are powerful driving forces for applying automation to services," but Davis said she could point out only a few instances of automation in use today.

"Transportation is one area where "automation is not a new phenomenon," she asserted.

She cited air traffic control, the Bart system of San Francisco and automated identification of railroad cars.

"These have become "highly visible to the public both because of their innovation and their problems," she said.

Davis predicted the problems would "disappear as the management and substance of the technology improves, and the usefulness of these techniques will "long outlast the problems," she said.

"A comforting feature of automation is that it is not synonymous with the elimination of people." Instead, she explained, "people in the control function are generally assisted by machines."

Davis mentioned computer-aided design (CAD) and computer-aided manu-

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Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160.

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50 cents a copy: $12 a year in the U.S.; $13 a year in Canada; all other foreign, $36 a year. Four weeks notice required for change of address.

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Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

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IBM Ordered To Discuss Post-'69 Affairs

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – IBM Chairman Frank T. Cary and other IBM officials have been ordered to answer Department of Justice questions that they earlier refused to answer regarding IBM's business after 1969.

Cary and William A. Hartigan, IBM budget manager, had previously refused to answer such questions on the advice of counsel, saying they were not relevant to the case since they covered areas after the case was filed.

Chief Judge David Edelstein, while not ruling that such information would actually be allowed into the case, ordered the questions answered along with any other questions that might be raised by such answers.

The questions which have been avoided by some IBM managers regard the firm's policies and practices in the peripherals marketplace and in the leasing area.

IBM lawyers have argued that these issues involve policies and practices adopted after the suit was filed and therefore cannot be brought up by the government in its massive antitrust case against the firm.

However, the government has contended that the purpose of the discovery procedure in a case of this size is to discover information about a firm's practices, whether they occurred before or after the actual filing of the suit.

IBM has objected strenuously in recent filings to the government's mention of any of these subjects, such as the 2319A disk drive, the 2319B disk drive, the 370 line and various other newer products or policies of the firm.

However, Edelstein said "all objections to requests for discovery predicated on the ground that the item or answer sought is irrelevant to the subject matter of this action are to be noted, but the item sought or answer requested shall be given."

Several sources indicated last week that the government's case is significantly stronger when the "postcomplaint" issues are included.

In addition, they indicated that Edelstein seemed to be leaning in the direction of allowing such material into the trial, which is slated to start either very late this year or early next year.

Constitutional Clash in the Offing?

NEW YORK – The constitutional clash that was narrowly averted when President Nixon obeyed a Supreme Court ruling to turn over additional tapes to the Watergate prosecutors may be enacted in miniature here in the government's suit against IBM.

The direct clash between the Judicial and Executive branches of the government could come if Judge David Edelstein orders Commerce Secretary Frederick Dent to turn over to IBM certain documents it has requested.

Dent has so far withheld the documents claiming it would not be in the national interest to turn them over to IBM. He further claims he is bound by law by keep them confidential.

Edelstein, who has been working to head off any direct clash with the Executive branch, indicated last week that he had not ruled out ordering such sanctions as contempt citations against Dent if he continues to refuse to turn over the requested material.

IBM has filed a motion requesting Edelstein to take the step of a contempt citation against the Commerce Secretary, and Edelstein indicated last week that he was seriously considering the move.

At the same time, however, he ordered the lawyers for both IBM and the Department of Justice to continue to try to work out a solution to the problem that would not require such a drastic step.

Users Warned Power Variations Could Be Costly

(Continued from Page 1)

dip or surge for less than 30 msec.

Finally, the study indicated, normal power net switching by local utilities can account for 30 to several hundred outages per year, each lasting over one second, and thus easily extending beyond the typical computer limit for complete voltage loss of 15 msec.

Computer users can expect these "voltage excursions" to result in "output errors, unscheduled computer shutdowns, loss of information, equipment damage and high costs of downtime, recovery and reruns," the report said.

"Users in areas like New York City and certain areas of New England and California have had problems with summer brownouts and blackouts overlaying any difficulties they might experience with these electrical power variations," the report continued. "Now that the energy crisis has fully emerged, the prospects of similar situations are appearing in other sections of the country."

Planned decreases, or brownouts, by local utilities at utility generating points in steps of 3%, 5% or 8% can cause the steady state voltage at equipment connections to decline considerably below -9%, according to the report.

The study added that unscheduled blackouts or "voltage discontinuities" produce similar results. Even when blackouts are planned by local utilities and should not result in equipment damage or errors for users, repetitive powering up and down of computers can shorten component life, leading to unexpected shutdowns and errors, the report said.

Remedies Available

Though faced with these uncertainties, the computer user does have access to a variety of systems which provide protection against voltage fluctuations and outages. Among those detailed by the report are motor-generator sets, line conditioners, voltage regulators and uninterruptible power supplies (UPS).

While a UPS system coupled with an engine generator will permit a user to continue operations regardless of power disturbances, the report noted "the cost of these devices has tended to deter many users in the past from investing" in this kind of protection.

But according to a utility official quoted in the study, many more users are going to these devices in anticipation of increased utility outages in the future.

Before deciding to purchase any of these devices, however, the report cautioned users to first determine the voltage levels their computers are receiving and reminded them that the unit cost of a protective device varies inversely with the size of the computer system to be protected.

The 16-page report, "The Effects of Electrical Power Variations Upon Computers: An Overview," was prepared by the Office of Business Research and Analysis in the Commerce Department's Bureau of Domestic Commerce and can be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 for 55 cents per copy.

Automation: Help or Pink Slip?

(Continued from Page 1)

facturing (CAM) as valuable aids for control functions.

CAD, which "speeds up the elapsed time between initial product concept and production operation," and CAM, which "involves computer control of manufacturing processes," both offer "a high potential for improving product quality.

"They could also reduce costs, dramatically accelerate the design process and thus decrease the research and development costs for new products." These changes, Davis said, will "benefit both our national security interests and our economy."

Davis also spoke of the revolution in paper handling and recordkeeping that has come about as a result of automation.

"Paperwork," Davis said, "affects almost 40% of the work force of the U.S." Few occupations are more disliked or poorly performed. These jobs epitomize the "tedious, horing and repetitive daily chores" which people point to as dehumanizing, she said.

'Manipulators'

W.E. Bradley, an independent automation expert, described two types of presently feasible, computer-based automation techniques which allow a person to control work going on in a remote location from a confortable, safe environment.

One type involves a "telefactor" class of machines, and the other, a "master-slave manipulator," according to Bradley.

The telefactor machine allows a person, by means of head-controlled, closed-circuit television systems, to "see" the remote location and operate a machine which performs a task practically as if he were there, Bradley explained.

"The master executes the task while, at the same time, the slave, perhaps designed with long arms and joints that can do the same work as humans, duplicates electronically the task in question in the hostile environment," he said.

In addition to the obvious advantages to the worker, these remotely manned systems can provide significant production advantages, according to Bradley, including:

- All actions of a telefactor system can be recorded on tape so that every event can be analyzed in detail later.
- The systems can allow new tasks to be performed without rehearsal, when necessary, relying on the knowledge and judgment of the operator.
- Operators can be changed freely to avoid fatigue or to bring special knowledge and skills to the task while the machine can be operated 24 hours a day if necessary.

Timely Data

PHOENIX – At the general hospital here, as in many hospitals, a computer prints out a daily count of patients in its beds.

Surnames and initials, room number and the last two digits of the year of birth are included for each patient.

Recently a clerk spotted a Febronio Navarro of El Mirage on the hospital census. According to the printout, he was born in '69, but due to an apparent mix-up, Febronio had been placed in an adult ward rather than a pediatric bed.

Another clerk sent to straighten out the matter discovered that Febronio was indeed born in '69 – 1869, not 1969 – and was right where he belonged.

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Florida Survey Claims

Women DPers Work More, Earn Less

By Nancy French
Of the CW Staff

MIAMI – A recent Labor Department wage survey of Dade County showed women programmers and operators here earn less – by about $20 per week – while working longer hours than men in the same or similar jobs.

The wage survey, conducted in November 1973 and released recently, covered 116,835 workers in the county in companies with 50 or more employees, with the exception of the construction industry.

According to the survey director, 209 of the county's 1,209 businesses were sampled. The results, he said, are fairly representative of conditions throughout the country.

The Labor Department survey divided data processing jobs into three categories: operators, programmers and analysts, with each category further divided into three classes: A, B and C, with Class A representing the most complex of the three work levels.

In the computer programmer category, men earned more than women in every class: Class A men programmers, an average of $266.50 per week, compared with $255.50 for women; Class B men, an average of $222.50, compared with $209.50 per week for women; and Class C men, an average weekly wage of $196, compared with $180.50 for women.

Average hours worked in the programmer category were 38 for women, 37-1/2 for men.

In Class C of the computer operator category, women earned $142.00, compared with $140.50 per week for men.

Mary Hilton, a Labor Department spokeswoman in Washington, said the higher pay earned by women in this job class could be attributed to seniority – women continue at the lowest category for several years while men are promoted into other positions.

Women operators worked an average of 39-1/2 hours per week compared with 39 for men.

The computer systems analyst, by far the highest paid category, showed men earning an average weekly salary of $298.50 and $276.00, for classes A and B, respectively. The survey turned up no women in the systems analyst class.

Survey director Donald Cruse, assistant regional director for operations for the Labor Department's Southern Region, claimed the wage discrepancies in data processing are due to seniority.

"I don't think women moved into that area until recently," Cruse said.

But figures in other job categories failed to support Cruse's contention.

In every other job category, from janitor to order filler to accounting clerk, the pay discrepancies were about the same – women earned just a little more than $20 per week less than men with similar jobs in Dade County.

Cruse pointed out that in all Labor Department surveys the following two qualifiers should be kept in mind when considering the statistics:

First, no statistics are reported if a single company reports 60% or more of the total employees surveyed are in a particular job category. Second, figures are not reported in a single job category if fewer than 25 people are employed in that category in the survey area.

Client Privacy Less Important Than Data Security, Study Shows

BOSTON – How secure is the computerized information stored and processed by banks and other financial institutions?

A survey of data managers here found that "privacy" of client information takes a back seat to "security" of client information.

According to Torben G. Gronning of MIT, who conducted the survey, "managers feel quite confident about the adequacy of the current level of protection from intentional or accidental destruction, modification or disclosure."

However, Gronning said, "the survey also found that preventing the disclosure of client information was believed to be less imperative than preventing destruction or modification, for example, in the case of fraud or embezzlement."

A member of the Sloan Information Systems Security Project at MIT, Gronning said his findings appear to represent the financial community at large.

Gronning's sampling of data managers showed little concern for any need for greater data security despite "the deep changes data processing is currently undergoing," he said.

With little internal effort directed toward data security in the financial community, the prospect arises of an outside force – such as the Federal Government – taking on that concern, he noted.

"The changes necessary to create a high degree of privacy and integrity are so fundamental and far-reaching that it seems unrealistic to expect data security policymaking to be limited to the information system users and the computer manufacturers," he said.

Gronning cited recent legislative action in Sweden that eliminated secret records, authorized individual knowledge of the existence, contents and use of all data file records, and created a data inspection board to oversee the existence of all files.

"The use of the general individual identifier – such as the Social Security Number – is now permitted in Sweden only if the information user can document a genuine need," Gronning said. "The results of such a law in the U.S. probably would be the abolition of the use of the Social Security Number for commercial purposes, such as bank accounts, insurance policies and credit cards.

Dutch Want Data Banks Licensed

THE HAGUE, The Netherlands – Strengthening the legal position of Dutch citizens registered in personal information systems and creating a licensing authority for "sensitive" data banks were two major recommendations made by a Dutch government commission on the protection of privacy and personal data.

The recommendations; contained in an interim report, are subject to further hearings and refinements and represent a two-year study.

Noting "the progressive development toward concentrated storage of personal data," the commission "considers the dangers inherent in present developments to be so great that it would be irresponsible for legislators to ignore them," the report said.

The commission recommended:

- Personal records be open to inspection by individuals but copies of files should not be made available.
- A public register be set up listing all registration systems containing personal information and describing rules governing each register.
- Registration of all data banks be required, and those systems containing "the greatest threat to privacy" be licensed.
- Special rules and controls govern investigative reports on persons.

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Schools, State Officials at Odds Over Proposed Consolidation Plan

By Patrick Ward
Of the CW Staff

SALT LAKE CITY – Utah's schools and colleges are facing pressure to consolidate their computer equipment with the state's own computer center, but education officials here want to keep their control over these "vital management tools," according to Dr. R.J. Snow, assistant to the president of the University of Utah.

The Systems Planning and Computing Board (SPC), which governs the state computer center, has already proposed that the Board of Education give up its own IBM 370/145 and do its work on the central computer facility's IBM 370/158. The SPC's plan was that the 370/145 could then serve as a common computer for the University of Utah and Weber State College, both of which wanted to upgrade from IBM 360/40s to 370/135s.

But the Board of Education refused, and the two state schools came up with studies that showed that personnel costs would make a shared 370/145 more expensive to use than separate 370/135s.

So far the colleges "haven't heard a specific proposal that the SPC take over their computer facilities," Snow said, but there is pressure from the SPC in that direction, as well as "latent pressure for the universities to consolidate among themselves."

Snow said the universities don't object to SPC review, but feel that either singly or through their own consolidated facility they should have control over their own computers.

University of Utah President David P. Gardner has also pointed out that universities traditionally have been shielded from political whims, and he argued that putting control of university computers under the SPC could violate this principle.

A legislative subcommittee is considering amending the law that governs the SPC's jurisdiction, officials noted.

Legalities Unclear

Part of the problem is that the legislative bill that created the SPC is unclear on the SPC's jurisdiction over schools and colleges. Both the SPC and state educators have won differing legal opinions on the subject.

"There's no question in my mind that you could save money" by tying the schools together to one or more CPUs, observed Dr. Ron Thurgood, a systems specialist with the SPC.

Thurgood said the SPC is not pushing for the consolidation of university and state administrative computing, but for more coordination between them and perhaps more resource sharing between the colleges and surrounding high schools.

A De-Grading Experience

ROCHESTER, N.Y. – Monroe High School sophomore Patricia Burrows failed biology this year, according to her computerized report card.

But Patricia never actually took biology, and she's been trying to tell that to the school district all year.

The whole thing started with the first report card, said her mother, Mae Burrows, when Patricia got a "D" in biology.

"This kid works hard and gets all 'As' and 'Bs,' " Burrows said. "It was a shock to see a 'D.' I called the school and they said they'd fix it."

But they didn't. Patricia's second report card showed a "D," and the third, a failing grade of "E."

Worried that the grade could affect Patricia's records when she tries to get into college, Burrows called the district's DP department.

Roy McClory, its director, said he heard about the mistake after the third mark was given. McClory traced the mistake to a biology teacher in another high school who had used Patricia's identification number when he submitted the grades for another student, Patrick Burrows.

But Burrows' jawboning didn't do much good, because Patricia's last report card showed an "N" for "None" in the box where the final grade should be, and the box for the exam grade said "Excused."

Finally, Burrows called school superintendent John Franco, threatening to notify her lawyer and sue the district.

"He called back within 20 minutes and said the marks would be erased," she said. "He was very concerned."

"We still have to deal with the matter of the other student," Franco said, "who presumably has a report card that doesn't show his failing marks."

It's not too hard to understand why school officials never heard a word from the other student, he commented.

Swedish Data Act in Effect

(Continued from Page 1)

Notices were circulated throughout Sweden advising keepers of personal information to file with the board.

A pamphlet on the Swedish Data Act published by the Federation of Swedish Industries is available from the Swedish Embassy in Washington.

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Exhibit Visitors Treated Royally to Displays Plus...

CW at Ifip

By Ronald A. Frank
Of the CW Staff

STOCKHOLM – Visitors to the Ifip exhibition here last week were treated royally by exhibitors at the show, in the customary style of European trade shows.

Refreshments were part of the soft sell trade pitch and proper entertaining of a prospective customer was almost more important than talking about the equipment.

In addition to having one of the largest booths, or stands as they say, Saab-Scania had a bar in its area and was serving all who asked.

The company displayed several dedicated application systems including a special-purpose point-of-entry terminal for the meat packing industry. The "under $2,000" terminal contained special keys that could easily be changed to fit the needs of other industries, a spokesman said.

Toronto in '77

The Ifip committee has announced that its next conference will be held in 1977 in Toronto, Canada. The 1980 conference will be "shared" between Japan and Australia. Details of the schedule for the dual sites are still being worked out by the Ifip program committee for the 1980 meeting.

To illustrate the point, the firm had literature showing the same line-at-a-time display used in production data collection and clinical laboratory environments.

Specialized applications to solve specific problems seemed to be stressed more than the equipment being displayed. Even IBM's huge 370/158 operating with 2M bytes of storage plus 1,000M bytes of 3330 single- and double-density disks drew less interest than the applications it was running.

One of these was a data base representation of a town called "Ciceron," developed at the Datology Laboratory at Uppsala University. The software system was described as an experimental version of IBM's Lisp and had the capability to guide and direct an unfamiliar person through Central Uppsala. It used a subset of "natural Swedish" to interact on a common basis for easy understanding, the company said.

The 158 was installed at the show in about three days, according to an IBM spokesman, and it was scheduled to be installed at the firm's computing center in Stockholm after the show. The machine at the show was running both OS/VS1 and VM/370 and it was interacting with a 360/65 operating at a remote site.

Image Building

One of the firms at the exhibition was actually a user. Skandia Insurance Co. Ltd. had several CRTs which were used to demonstrate how the firm's management information system worked. A spokesman said, "We don't sell hardware or software," adding that the display was strictly an image building exercise for the company.

In explaining how the data base system works, members of the Skandia programming staff gave visitors demonstrations of demographic charts and data used to set policy rates and make other management decisions.

User Instruction seemed to occupy many of the exhibitors, and in many cases visitors could be seen getting instructions on how to operate a Singer point-of-sale system or a Computer Machinery Corp. data entry terminal without any kind of sales pitch.

Medical applications were being stressed by many of the companies because of the Medinfo show which was running concurrently with the Ifip congress.

Stansaab demonstrated its real-time patient display system working at a local hospital's intensive care unit to monitor cardiac surgery patients and severe road accident trauma cases.

Videoton Ltd. from Budapest, Hungary, demonstrated its graphic display system, which was operating on-line at 2,400 bit/sec to university DP centers in Delft, Holland, and Budapest.

The system includes a 32K 16-bit minicomputer built by the company and it is available in both Europe and the U.S. A spokesman said one of the graphic systems, which costs between $60,000 and $80,000, has been sold in the U.S.

The system can be used for circuit design and it includes a light pen for the operator to interact with the information displayed on the screen.

Another exhibitor, Dafa, is the national data center in Sweden for administrative data processing. The independent agency and service bureau was formed in 1970 and its operations are financed by contractual services. The agency employs about 340 DP people and it services both government and private users. At its Stockholm installation, Dafa has an IBM 370/145 and 370/158 in a compatible "switch-over" configuration.

98 Firms Show Their Wares

STOCKHOLM – There were 98 exhibitors from 13 countries at the combined Ifip/Medinfo exhibition with many concentrating on data entry equipment.

Also stressed were systems for data collection, while OEM and medical applications were popular too. About 31 firms exhibited some type of terminal and most of these were operating with on-line software for demonstration purposes.

Seventeen processors were on display and 11 of these were minis. The largest was the IBM 370/158 which was operating on the floor of the exhibition. Philips showed its new Europe-only P852M, but the mini was not operating.

Since many of the show visitors were anxious to learn of systems operating in other countries, many of the discussions with exhibitora were on a "transfer of technology" level rather than on a buy/sell level. In all cases those manning the booths were eager to compare notes with visitors from other DP environments than their own.

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Even Panel of Experts Finds Programming's Future Unclear

STOCKHOLM – Four panelists at an Ifip panel discussion on the future of programming in the 1980s found they could agree only on the fact that the future is unclear.

Led by Dr. S. Gill of the UK, the panel included Robert Bemer from Honeywell, Phoenix, Ariz., who said programming will probably evolve into a subset of what is now known as text editing.

It may also be possible to develop software components that can be edited and combined to form new functions, he speculated, but this possibility was doubted by several of the other panelists.

Professor Andrei P. Ershov from the USSR said it is likely that programmers will draw more on mathematical approaches for their work. He also said programming could improve 10% through greater use of terminals to access existing information.

Ershov's comments began a debate concerning the future of structured programming, whereby known approaches are incorporated by the programmer in order to arrive at a faster, more effective solution.

First-Time Challenge

This approach was also referred to as "top down programming," an idea discounted by Professor Maurice Wilkes of the Mathematics Laboratory in Cambridge University, England. He said the real challenge to programmers occurs in doing something for the first time, while structured programming implies that the methods have already been accomplished in principle.

To access similar methods a second time is not startling, he said, adding that one of the unfortunate traits of humans, especially programmera, is that they have a memory that works only backward.

Answering a question from an attendee, Jean Sammet, programming language technology manager at IBM's Federal Systems Division, said she thought Fortran would die by about 1989, but she repeated an earlier statement that she was speaking as an individual and not for IBM.

Returning to the structured programming question, Ershov said this method works only if there are no mistakes made. He felt the chief programmer team concept held more promise. He also expressed the opinion that tightly coupled multiprocessors such as those used in IBM's MP configurations hold great promise for aiding the work of programmers.

Better, Not More

Although Sammet predicted the number of systems programmers will increase, Wilkes said better programs are not written by more programmers, they are only written by better ones.

Ershov then qualified his earlier statement by saying the real test of an efficient programmer is not only to apply math principles but also to understand what the user really wants and needs.

Sammet decried the poor career paths for programmers who do not want to move into management, suggesting these technical persons in many cases are worth as much or more than their managers and should be paid accordingly.

Several panelists said more of the programming functions would be done by the end user if the programming does not become more efficient, and Bemer added that many of these functions could be assigned to hardware.

Sammet agreed partially, adding there would be more interaction between the user and a CPU smart enough to understand the problem and perhaps have the capability to help develop the solution. She predicted this will include machines which can be programmed by the use of "natural languages."

None of the panelists was ready, however, to suggest that the use of existing programming languages could be eliminated in the 1980s, although Sammet said she looked for development of more high-level languages.

Consultant Cautions

DBMS Can Lock User Into Single Vendor

By Ronald A. Frank

Of the CW Staff

STOCKHOLM – Users who consider the installation of data base management systems (DBMS) should realize that this is a method by which the hardware vendor seeks to lock in the user. This is why vendors apply hard sell techniques to data base systems, according to a speaker at Ifip here last week.

While advocating the use of data bases in general, William Olle, an English software consultant, cautioned users that the vendor should not be allowed to make the decision.

CW at Ifip

The implementation of a complex vendor-supplied DBMS assumes that when the user has to upgrade his hardware, he will have to stay with the same vendor equipment to avoid costly software conversion, he said.

"Transplanting the DBMS from one environment to another which is sufficiently different can be a major problem," Olle cautioned. "When one considers the costs involved in transplanting from one environment to another, the payoff to the vendor in getting the customer to use his DBMS becomes very obvious," he added.

The consultant said many companies with larger machines seem to be installing DBMS as a kind of intercorporate status symbol, and he advised that the benefits should be carefully examined before such a system is implemented.

The best rationale for installing a DBMS is the ability to make more effective use of the extra dimension provided by direct access devices, thereby allowing previously segmented application programs to be integrated. And this in turn serves to minimize the redundant storage of data used by two or more of the programs. To accomplish this, the user often has on his hands a "fairly thorough overhaul," Olla said.

There are typically four principal user interfaces to the data base: the data administrator, the programmer, the nonprogrammer or specific user, and the "parametric user," Olle suggested. He described the last category as a user who interfaces with the data base in such a way that he does not have to understand the data structure, Boolean algebra, or the algorithm used in the process he is invoking.

The parametric user's transaction may have a name or it may be identified by an action performed at the terminal such as pressing a control key. Normally the transaction will have one or more parameters, such as an account number for a bank or a flight number and date for an airline clerk. It is necessary to give a value to these parameters for each transaction and hence the term parametric, Olle explained.

Turning to a discussion of possible future trends in DBMS, Olle described three directions which programmer interfaces might take in the future. First, there can be a continuation of the present two storage levels whereby the data is in a different level of storage than the one in which the program executes.

A second possibility would be that the DBMS uses two levels of storage but the programmer believes everything happens in one level. Third, the economics of hardware usage might improve to such an extent that enormous memory machines are possible.

The alternative which merits the most scrutiny for the future is the second, Olle said. While this is not a new idea its effectiveness is limited to the storage of programs and their data files on a paging drum, which is an extension of core storage to the programmer. He questioned whether it would be possible to extend this concept to large data bases.

Referring to a statement made by Grace Hopper that large data bases must be broken down for handling by minicomputers, Olle said this prognostication was actually "two steps ahead of the game.

"First a study of usage patterns derived by a DBMS monitoring itself could indicate acceptable breakdown for handling by minis. And this breakdown would almost certainly be quite different from the defined segments from which the data base was first built up."

After the segmentation, the data base portions would then be ready for handling by a series of minis, Olle implied.

Truly International

STOCKHOLM – More than 3,000 attendees from 52 countries attended the Ifip conference here last week.

As would be expected, the host country Sweden had the largest contingent with 750, while the U.S. had 400 persons at the show.

About 300 came from Germany, while nearby countries such as Great Britain, Norway, Denmark, The Netherlands, France and Finland each had more than 100 representatives at the conference.

About 1,000 persons attended the concurrent Medinfo '74 conference, making the total attendance close to 5,000 for the two DP events.

DP Power Concentrations Need Social Awareness

(Continued from Page 1)

ticularly delicate" in this regard, she said. First, the "near-sacrosanct" principle embedded in Sweden's constitution that "all documents shall be openly available to the public."

Second, the multiplication of documents, data and information rapidly accumulating through the use of data processing, and, lastly, that each Swede is given a personal identification number that makes it easy to "cross-reference computer registers and, through linkage, obtain any amount of personal data."

The new Swedish law provides a method for handling these manifold problems, Myrdal said. It establishes a data inspection board with "sweeping powers" over data banks, provides penalties for "data trespass," or unauthorized access, and provides penalties for improper disclosure of information gained "through employment of a data processing activity," she explained.

The law also gives the individual the explicit right to obtain information about him kept by public administrations, banks, employers and so forth.

But since the law only went into effect on July 1, 1974, the DP community will have to take a wait-and-see attitude on its effectiveness, Myrdal said.

Similar work related to protecting individual rights is also being given "close attention" by the Organization for Economic Cooperation and Development (OECD), Council of Europe, International Commission of Jurists and the United Nations, she added.

Opening session attendees also heard Dr. Herbert Freeman from New York University and program committee chairman for the conference explain that the 18 scheduled panel discussion sessions would have no formal records kept. This was being done in order to allow experts to speak freely about the latest activities in their area of interest, he said.

Medical Field Ill-Prepared for DP Introduction

(Continued from Page 1)

The new medical DP systems should not be more comprehensive, circumstantial or sophisticated than they need to be, Gronwall said, calling for:

- Basic research in medical informatics.
- Experimental applications.
- Evaluation of experiments.
- Education.

Relatively unimportant sums have been spent on the development of medical information systems, and research has been incompletely dealt with or totally neglected, he said.

There is a need to define the need for information and the relative value it may have, he added.

One of the tasks of the conference should be to indicate guidelines for such research, the keynoter said.

Noting it was 15 years since the pioneers in the medical information field first said how backward the old information systems were, Gronwall said many psychological factors are associated with introducing DP systems into the medical field and not the least is the fact that doctors and nurses as a group suffer from a lack of training and experience; they do not generally include this discipline as part of their ordinary professional training.

The few medical professionals who do encounter DP courses usually do work oriented to coding and machine operation, but the real need for training lies in the definitions of information systems, processing and the storage and retrieval of data, he stated.

On the bright side, Gronwall cited the number of medical specialists that are becoming experts in data processing. He said these experts will help to assure that the aim is not to computerize the hospital but instead to hospitalize the computer.

The News From Here

STOCKHOLM – With typical efficiency, Ifip managed to issue a daily paper for those attending the show here. The first edition on Tuesday included photos from the reception held by the mayor of Stockholm the previous evening.

For many Americans, the paper was one of the few sources of news from home so its one page of news was eagerly read.

The publication was a cooperative effort funded by IBM, Univac and three Swedish DP organizations including Datasaab, Stansaab and Regne-Centralen. Visiting DP journalists from several countries contributed articles for the publication, which also provided attendees with last minute program changes.

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Editorial

New Era in Communications?

IBM is coming closer to the beginning of its new era in data communications, as pointed out in CW's July 31 special report.

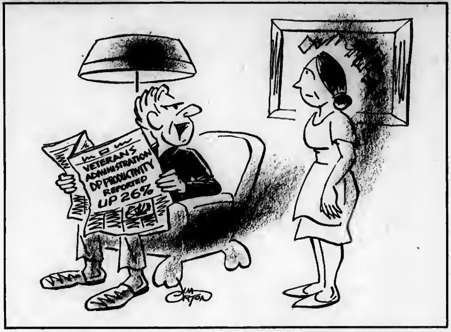
In the world of telecommunications, the introduction of a new line protocol can be a traumatic experience since it affects the user's terminals, front-end equipment, software and often his network configuration.

A successful telecommunications network is an undertaking that is carefully balanced and configured over an extended time period to meet specific user applications. And this involves a considerable investment in both time and money (not to mention specialized skills).

Thus the introduction of a new line protocol such as IBM's Synchronous Data Link Control (SDLC) should not be equated with the introduction of plug-compatible peripherals during the late sixties and early seventies.

But the user should not be scared off by the many facets of a network conversion. The benefits of the new protocol and the terminal equipment designed to use it could be substantial.

It remains for the user to decide exactly when the reconfiguration of his network becomes a cost-effective proposition. But until we all know more about the plans of IBM and the terminal vendors that plan to offer comparable equipment, we will all have to maintain a wait-and-see posture.


VETERANS ADMINISTRATION DP PRODUCTIVITY REPORTED UP 26%
JIM ORTON

'It Must Be All These 'Sorry, Your Check Is Late Again' Notices They've Been Sending Lately'

Letters to the Editor

Company Software Routines Often Unnecessary Duplicates

It occurs to me that the cost of disorientation, confusion and retraining new programmers must be tremendous when they are required to *relearn* how to update a library or attach control information to a file or write a report, when they move from one company to another.

For example, Cobol has certain features which allow sorting to be done, reports to be formatted, control information to be attached to a file (user label feature) – all quite efficiently and with little or no reorientation when switching companies. IBM has utility programs which allow great flexibility in file manipulation (including library maintenance).

Because his company's "software" group may not support these facilities, the poor programmer is required to wade through 200 or 300 pages of detailed instruction describing company-oriented "software" routines, and is subject to disorientation and confusion, when he already knows how to accomplish the task using truly standardized procedures.

Has anyone considered the possibility of limiting the development of *company*-oriented "software" (quotes indicate sarcasm) to those capabilities which are *not* contained in the software of the systems they are using?

J. Robson Phipps Jr.
Motorola, Inc.
Franklin Park, Ill.

Congressman Goldwater Speaks with Forked Tongue?

Congressman Barry Goldwater Jr. (R–Calif.) speaks with forked tongue. The July 31 issue of *Computerworld* quotes him as saying it has been difficult getting input from business and industry on proposed privacy legislation. – Not so. I personally have been writing to him for over two years.

All the computer trade publications have been crying that the proposed legislation is unworkable. A representative from the National Bureau of Standards has questioned both the workability and the costs.

We are all trying to find a way to protect the rights of the individual without denying credit or other services to worthy individuals. Goldwater sponsored a bad bill. He does not even acknowledge correspondence on this subject any more.

I conclude that Goldwater doesn't want to know.

Robert L..Patrick
Computer Specialist
Northridge, Calif.

Graduate Doesn't Regret Choice of Private DP School

I for one am very happy about the existence of private DP schools. I have never lived in or near a ghetto, have a good education and speak English well.

Working as a secretary for a then major independent DP service bureau and user of much IBM equipment, I was unsuccessful in being sent to IBM classes which at that time (1962-63) were free to user personnel.

University evening courses (three semesters) or private DP schools (three months) were the alternatives; the cost for either was approximately the same.

Time was the important factor in my decision to attend the DP school and I have never regretted it.

Subsequent to completion of the course I entered the DP field and have been enjoying my work ever since. I never thought of taking advantage of the school's advertised placement service and thus cannot comment on it.

Since that time I have attended many DP seminars and classes, but nowhere have I seen 100% of the student body so attentive to the instructor and the material presented and work so diligently for their success.

C.M. Schacht
Systems Application Engineer
ITT
East Rutherford, N.J.

Another Satisfied Graduate

After following the pro and con letters and articles concerning the private DP school, I feel compelled to mention that, while I can imagine there are unscrupulous persons in charge of some of these schools, there are schools which are trying to do a good job and which can be an asset to the data processing community.

For example, several years ago, with a bachelor's degree in mathematics and two years of teaching behind me, I decided that the junior high classroom was not providing the mental stimulation that made me choose math as a major. Knowing that data processing required a logical mind, I chose to attend a three-and-a-half month course at the ECPI franchise school in Harrisburg, Pa.

After the horror stories recounted in recent *Computerworld* issues, this school seems even better than I've always thought.

There was a small computer on the premises, and three full-time instructors who led classes four hours in the morning, five days a week. The school remained open in the afternoon, with at least one of the instructors in attendance, for students who wished to use the computer or to be tutored in areas proving difficult.

There was no extra charge for taking advantage of the afternoon offering, but I must admit that few of my classmates did.

The school was ideal for me because it would have taken at least a year to obtain through college evening courses the information I absorbed in the three-and-a-half months of intensive study at this private school.

Jerri Lynn Burket
Programmer
Buckeye Pipe Line Co.
Emmaus, Pa.

Donation Requested

Central Catholic High School is a small four-year parochial high school of about 600 students. For the past five years we have been fortunate to have, on loan from Oregon State University, an Alwac III-E computer. Al is a 20-year-old vacuum tube computer with 8K of magnetic drum storage and peripherals presently limited to a flexowriter and a high-speed paper tape reader and punch.

In the past five years Al has been used for learning compiler and machine language programming, the principles of digital computers and, to a limited extent, as a tool for science and mathematics classes. The terms of the loan expire this summer. Although it might be possible to renew the loan, there are a number of reasons why it might not be advisable to renew.

Twenty years is a very old age for a computer. It would be very beneficial to have students exposed to hardware a little less obsolete. Along with old age comes increased maintenance.

Even though we do our own maintenance work, the increasing breakdown of components is becoming more costly than a parochial school of our size can afford.

Sometime ago I read an article in *Computerworld* in which it was claimed that organizations replacing DP equipment might find themselves better off, considering tax deductions and public relations, if they would donate such equipment to nonprofit institutions instead of trying to market it. We would like to know how to find and contact such possible donors.

Father Peter Roerig
Central Catholic High School
2401 S.E. Stark
Portland, Ore. 97214

Poetry Anyone?

I am trying to locate some poetry about computers. If any readers know of any I would appreciate hearing of it.

D. Van Tassel
Computer Center
University of California
Santa Cruz, Calif. 95060

Read on. Ed.

Oh, Where Is He?

Oh where is he, that mad, mad fiend
who dreamed up *STRUCTURED PROGRAMMING?*
Oh where is he, the dirty fink,
who took from me my *GO TO* link
and whispers to me "A *PERFORM* you should use,
then you're free from all of those maintenance blues."

He must be near because, you see,
his logic haunts my coding spree
for as I'm happily coding along
and then think "Use the *GO TO*" he screams "No! That is wrong!"

Oh where is he, that mad, mad fiend
who dreamed up *STRUCTURED PROGRAMMING?*

Gene T. Ownbey
Programmer Analyst
Olin
Pisgah Forest, N.C.

(Other letters and viewpoints on Pages 9 and 10.)

Standard Object Code Will Improve Efficiency...

Viewpoint

By Jeffrey E. Ferris

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All of these things and probably many more will result from the establishment of a standard object code for processing Cobol programs.

Normally at this point I have to wait a few minutes for the laughter to die down. It is truly a relief to be able to forge ahead with this theory without shouting down the catcalls of the jeering mob. If you will stop and think for about two minutes, this idea may begin to make some sense.

The Cobol language is made up of less than 15 basic arithmetic and logical statements. However, the basic commands may be stated in many different ways, which accounts for the somewhat more complex structure than is indicated by this number.

In order to process the language effectively at the object level, it is necessary to have a language which handles a variable number of addresses with full descriptive information regarding the data format, operand size and other parameters of each address.

This can be achieved by use of an address block which describes for each address in the command all necessary factors. In addition, provision should be made for variable address length to allow unlimited memory addressing in tomorrow's low-cost CPU memory.

I/O operations are the knottiest part of this problem at first glance. After some examination, however, it becomes apparent that this technique could be a tremendous blessing in disguise.

It is not new to communicate to I/O software by means of file tables or blocks which contain the parameters for a standard I/O routine to transfer data from and to the object program. Expanding this technique to include the entire gamut of Cobol I/O operations will lead to some real breakthroughs in I/O handling at the hardware level.

System software designers will be able to design their I/O routines to provide data to an object program in the manner that is most efficient for their hardware. I really don't care if the data is stored five records per block. I just want to get data into and out of memory as efficiently as possible.

If I didn't have to know a single detail as to how the I/O software was handling data, it would be a vast improvement over our present constant obsession with efficient data handling on our particular hardware. I can envision I/O processors programmed from the ground up for nothing but handling Cobol I/O transfers. These devices might be called I/O subsystems and might be purchased independently of the mainframe CPU.

Why Cobol? Because I am most familiar with this language and one must start somewhere. There are no reasons why every major language couldn't be included in this standardization effort.

How can we ask all the major vendors to redesign their hardware for this new standard? In case you haven't heard about it this is the age of microcode.

Most of the major systems available today are microcoded and can be reprogrammed to execute any new code that comes along. A few vendors would be forced to produce redesigned hardware. These would be the really lucky ones. They would be able to produce hardwired systems for the execution of the standard object code. Their efficiency would have to be better than the microcode approach.

The idea is feasible. Is it desirable? I can see no one that could logically object other than the vendors.

If enough of us get together in this endeavor, we may actually be able to get some user input regarding the future course of our industry.

If we do not act now, the next 20 years of data processing will be dictated by the needs and goals of nonhuman corporate monoliths. We cannot leave our futures to the tender mercies of these witless organisms.

Jeffrey E. Ferris is with J.E. Ferris & Associates, Mobile, Ala.

...But 'Effective' Computing Must Have Priority

Viewpoint

By Shulom Kurtz

Special to Computerworld

Responding to the opening question in "Cobol Clinic" [CW, May 8], I resort to a broader approach: are any other readers as weary as I am of reading about the "best" way to do *anything* in program coding?

A couple of years ago, a symposium was held called "Effective vs. Efficient Computing." The entire thrust of this effort was that too many computerniks show more concern with being extremely efficient in solving the wrong problem than with doing some effective computing.

The "Cobol Clinic" cited above typifies the first approach, a total waste of effort in finding ways to save a few dozen microseconds in an application program. To settle that point: real study of 360 hardware characteristics reveals that, in addition to hex 40 for a blank, the printer accepts hex 00 at no loss of operational speed. Hence, the most efficient code for blanking print line is a *single instruction:* XC LINE, LINE, which is processor independent in the series.

The Real Problems

Now that this highly significant problem has been finally laid to rest, has anyone out there addressed the real problems facing the DP community:

- After all the fancy coding techniques urged by bit fiddlers, how about reducing the overall cost of programming which is now the major part of DP cost? Why not create a program together with proof of sufficiency to do the job under all circumstances and proof of correctness? Why not create a program susceptible to maintenance by qualified personnel without requiring long hours of study to decipher clever coding tricks and to correct logic traps created by ingenious techniques?
- With all the concern about applications program efficiency, why not look at the horrendous overheads built into operating systems and then put things into a proper perspective?
- With all the high-sounding statements about professionalism (meaning technical proficiency), why not seek true professionalism that goes beyond mere competence to show concern for the impact of our high technology on society? Why not direct these talented brains toward analyzing a means of creating workable techniques for protecting personal privacy and individual rights, instead of waiting for unworkable laws to be passed by nontechnically oriented legislative bodies, and then bemoaning the problems inflicted by such acts?

Quoting a one-sentence description of the symposium previously noted, "Are you doing the right thing, or are you just doing the thing right?"

Pause and Reflect

To all the self-righteous experts in our field (which abounds with such types): stop for a moment and think (provided that word hasn't yet been copyrighted); reflect on the possibility that your best efforts might possibly mean returning some value to the people who are paying your salary, not by resorting to coding pad and pencil when an assignment is given, but by seeing how clearly you can expound a problem definition and solution. Follow this by making sure the implementation of that solution is produced quickly, maintainably, and most importantly, in such a manner that no traumatic conversion situations arise with the next generation of hardware.

These are the real areas of DP costs, not the costs of machine cycles. These are the places where you can begin earning your keep.

Shulom Kurtz is with K, Inc., Denver, Colo.

DP Firms' Poor Programming: One Problem Was Input

The Taylor Report

By

Alan Taylor, CDP

Thomas Manning of Honeywell was surprised when he started investigating the case of the "hiccuping" computer illustrated here last week [CW, Aug. 7]. In the illustration, the bill for a course taken by Oscar Ortega was duplicated and the total bill was $50, instead of the $25 the course actually cost.

The bill itself was in chaos with some lines duplicated on a line-by-line basis, others on a two-line basis and one group on a 10-line basis!

When Manning looked through all the output, he discovered this was the *only* part where the system had made an error. This drew his attention to the input. Pulling a copy of the input stream he found that the keypunch operator had double-punched many of the input cards.

The card number one with the name "University Community Hospital" had been double-punched, as had the box number in card number two. Card number three, the final part of the actual printed address, and cards number four and five which were blank – held in reverse in case there were further lines of the address – had all been double-punched. So had the key card covering Ortega's attendance at course Number 236.

It wasn't that the keypunch operator had simply punched one set and then *accidentally* punched another. Each of the card types was next to each other, with the second card number one following the previous card number one. There was even a difference between the cards. On the right-hand side, one card showed a 9250 in the departmental column, while 8160 was punched in the second.

Tracking Down the Error

With this clue Manning was able to pull out the transmittal form where the departmental number was specified. The number should have been punched in columns 71 through 75 but the number given on this particular transmittal was a nine-digit field – 9250/8160 to be precise – not a four-digit number.

This was actually an error at the time the input was created. The desired number was simply 9250, which is the correct departmental number.

Honeywell, however, also uses a full nine-digit reference – the departmental number plus a subdepartmental number (such as 8160) which breaks down the departmental accounts into items like rent, telephone number, etc. In an obvious error, the full nine-digit number had been entered on the form at the time it was created.

Faced with the problem of getting nine characters into a four-digit field, the operator, with no idea the result would be used for billing purposes, succeeded by ignoring the slash between the two numbers and simply duplicated the entries.

As a result we had the "hiccuping" computer.

This result does of course indicate a number of problems that do genuinely occur. Honeywell has now met some of them, at least, by inserting a new routine in the program. This scans from one line to the next and kicks the line out if it is a duplicate of the previous one.

Such a routine, however, does not prevent numbers of more than four digits from appearing in the departmental number column. There is actually space for about a 20-digit number there although space is needed only for four digits!

Nor does this new routine really handle the printing problem. The printing went on, beyond the body area, and overprinted the preprinted information at the bottom of the form.

Apparently, somewhere in the program the line counter had gone wrong.

I suspect the reason was that the line counter picked up the end of the heading information such as the address number and assumed it was on a specific line. Thus, if the last nonblank address number card was, as was the case this time, card number three, the line counter assumed it had some 40 lines left. In point of fact it didn't in this particular case.

This is just a guess at what actually happened. But in any case the Honeywell duplicate line routine does not handle the matter.

All in all, this history of why the computer "hiccuped" indicates what happens when input is simply not well-known in advance. Both the keypunch operator, faced with a mistakenly created form, and the person making out the form, faced with a form which permitted him to create additional unexpected input, made perfectly logical estimates as to what to do under a given situation.

Then they went ahead and did it. It so happened that what they did was not anticipated by the systems analyst who instructed the programmer. It also happened that what they did apparently had never previously occurred since the program went into operation last April.

The whole situation simply illustrates the fact that no matter how much planning goes into the creation of a system, the state of the art cannot stop unanticipated input, and when unanticipated input does occur, incorrect output will probably also occur.

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Letters to the Editor

Business DP Education — Who Has Failed?

Many Educators Promote Old, Obsolete Curricula

After reading a report in *Computerworld* on the National Computer Conference session entitled "Business Data Processing Education – A Decade of Failure" [CW, May 15] I wrote for and received a reprint of the talks given by Gary B. Shelly and Thomas B. Cashman.

Shortly thereafter, I also read the comments by J. Daniel Couger in *Computerworld*.

I agreed, in principle, with Cashman's remarks concerning the failure of the industry to let the educators know what is needed (and what is lacking) in the education of persons supposedly entering the DP profession. I, too, feel that the industry and its so-called professional societies can influence and give direction to educators to a much greater degree than heretofore.

I was very much impressed with Shelly's insight into the shortcomings of the educational institutions, both public and private, and the reasons these failures occurred. His logic was sound and his examples (for the most part) were realistic.

The attempted "put-down" by Couger seemed to me to bear out and reinforce some of Shelly's statements. For example, Couger's claim that "improvement results from analysis of academic programs . . ." affirms the validity of Shelly's statement that "proper up-to-date training has not been available from the beginning."

Nearly any programmer could tell you that you can continue to improve a program, and improve a program only so long, and then you are better off throwing the whole thing out and taking a whole new tack.

I believe Couger is still in the typical "rut" of many of our "educational" institutions. As long as you "improve" an existing, obsolete and useless curriculum by analyzing the curriculum rather than by what is needed and lacking in that curriculum, you will find that in five years you will have an improved, obsolete curriculum.

Shelly, on the other hand, points the way with some very constructive and progressive suggestions: "techniques and methods of programming in a virtual storage environment, programming for data communications applications, teaching data base concepts and methods of structured programming.

But don't listen, you "educators." Continue to train students in methods that were used yesterday to face the world of tomorrow. Never mind what industry needs, teach what some other educator says you should teach, because some other educator told him what should be taught.

Earl G. Whiteley

Norristown, Pa.

Deficiencies Lay in Lack Of Integrated Knowledge

In the July 10 issue Gary B. Shelly commented on Dr. J. Daniel Couger's June 19 *Computerworld* review of the NCC session: "Business Data Processing Education – A Decade of Failure." Couger's review had reprimanded the session speakers and the NCC for not mentioning the business data processing curricula proposed by several hard-working Association for Computing Machinery (ACM) committees and reported in the *Communications of the ACM.*

Shelly replied that he saw the session as being directed to "vocational" business data processing education, which, he asserted, addresses 97% of the people entering the DP profession. Besides, he said, "there are more important things to do than search for papers which provide 'an important contribution to the literature of the field' because they evaluate the 'efforts of predecessors.' "

First, let me point out that "vocational" is not in the session title, indicating that the entire spectrum of DP education is to be addressed. Second, I am dismayed that an NCC speaker on DP education who communicated with over 800 DP instructors would fail to include one university DP professor.

Third, perhaps Shelly is partly the cause of DP education failure. The failure is the symptom; the cause is the lack of an integrated body of DP knowledge.

The only solution is for DPers like Shelly to read and to contribute to that body of knowledge.

Fred F. Newpeck

University of New Mexico
Albuquerque, N.M.

Associations Need 2d Look

In a recent letter to the editor [CW, July 17], James Augustine Jr., president of the Association of Educational Data Systems (AEDS), commented on the presentation I made at the National Computer Conference (NCC) on the panel, "Business Data Processing Education – A Decade of Failure."

In the presentation, I made a plea for a "professional association devoted first and foremost to the needs of business data processing teachers," and I also stated, "There is a need for support from existing, established organizations, such as DPMA; ACM and AEDS at the career education level." I also classified AEDS as an industry-oriented group.

Augustine stated, "She was mistaken when she referred to the Association of Educational Data Systems (AEDS) as an 'industry group' . . . I do not know how she arrived at this conclusion."

I arrived at this conclusion very simply: the primary thrust of AEDS is at the administrative DP level, processing student records, payroll, etc., with perhaps a secondary interest in areas such as computer-assisted instruction, etc. As a member of AEDS, I am well aware of what AEDS has to offer, and unfortunately the organization has little to offer the typical business DP teacher.

Take a look at the conference program for the 12th Annual Conference held in New York City in May 1974, or at AEDS publications. Few sessions and very few articles are devoted to the needs and interests of the business DP teacher.

Augustine's statement, "Their need to support the business DP teacher is clear, but is still another organization really necessary?", pointed out one of the reasons for the NCC session – the need to take an honest look at business DP education and the support it has been receiving from professional associations. Until "industry-oriented" groups take an honest look at what they are contributing to business DP education at the career education level, I still maintain an association is needed "dedicated first and foremost to the needs of business DP teachers."

Denise Ann Pierce

Stillwater, Okla.

Info 74, Before & After

According to advance billing, Info 74 is a show that will "focus on the 'information system' as a significant new concept that management must learn to understand." It will include word processing systems, Telecommunications systems, microfilm systems, duplicating systems, and computer systems. That's a tall order for one show, and *Computerworld* will be covering it as only a newsweekly can.

Our Sept. 11th Preview Issue will be issued as the show opens in New York, and will include information on important sessions and exhibits and the important new products that will be on display.

In our Sept. 18th wrap-up issue, we'll take a look at what went on, how it went, and what it all adds up to. Plus, we'll cover WESCON, which will be wrapping up its week on the coast at the same time.

Whether or not you're going to Info 74 or WESCON, you'll want to read about them in *Computerworld* . And if you're an advertiser, you'll want to be sure that your ad is there when *Computerworld* covers these shows. For all the details just contact your *Computerworld* salesman, or call Judy Milford at (617) 965-5800.

	Issue Date	*Color, insert close*	*B & W close*
Info 74 Preview Issue	**Sept. 11th**	**Aug. 23**	**Aug. 30**
Info 74 and WESCON wrap-up Issue	**Sept. 18th**	**Aug. 30**	**Sept. 6**

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Today the PDP-11, Tomorrow...

'Pogo' Designed as High-Level, Portable Language

By Don Leavitt
Of the CW Staff

NEWTON, Mass. – The Unisym approach to a universal language for minicomputers, proposed recently by an English software house [CW, July 7, 10, 17], is "interesting, but quite the opposite from the way we attacked somewhat the same problem," according to John Haasz and Roger Allen of Computer Power Australia.

Visiting here recently, the pair from "down under" described a high-level language called Pogo which they are developing for use over a wide range of CPUs, both minis and "maxis." Unisym is an Assembly-level approach to the problem of language transferabilty.

Though portability is one of the stated goals of Pogo, it is not the major one. The prime objective of the language, the Australians said, is to provide a superior replacement for Assembler.

Already in use and available for DEC's PDP-11/45 under RSX-11D, Pogo has also been designed to provide easy learning, use and debugging; fast compilation and efficient code generation; and reliability, Haasz went on.

Facilities and features normally available to the Assembler programmer must also be available to the Pogo programmer. But Pogo language constructions must generate short, efficient code sequences, Allen said.

With those objectives, language constructs which do not increase the fundamental power of the language but which do generate long code sequences are avoided. And "simple mechanisms" – such as "freely available listings of generated object code" – must be freely available so that "the programmer and not the compiler is in control."

Minimal Punctuation

The language itself is free format with minimal required punctuation. End-of-statement is signaled with a colon and end-of-line has no significance. Multiline statements and multistatement lines are natural. Comments are enclosed in parentheses and may occur almost anywhere, according to Haasz, who designed Pogo.

Hopefully, the age of large, monolithic programs has passed, he went on. Pogo programs are built from separately compiled mainline and subroutine modules. Each such module will normally have a simple, well-defined interface with other modules, Haasz added.

Unless specifically negated by the programmer, all Pogo programs are fully reentrant and may also be Called recursively. Reentrancy is almost a requirement under most modern multitasking operating sytems, he noted, allowing the sharing of code between many concurrent tasks.

Recursion is also an important programming technique in many sophisticated systems, he said, "permitting the simple programming of what would otherwise be a very complex procedure."

Few high-level languages offer powerful list-processing facilities, Haasz went on, but Pogo offers them in a natural, easy to learn and easy to use manner. These facilities are essential whenever complex dynamic data structures must be manipulated.

Requirements for such manipulation occur in operating systems, compilers and some applications involving dynamic structured data bases. In the case of Pogo, they were necessary since Pogo itself is programmed in Pogo, and new versions can be built from older ones.

The Pogo designer saw the ability to use symbols instead of constants as "essential to low-error rate, maintainable software." Pogo permits central definition of data structures and constants in such a way that standard names and values may be used throughout a software system.

Though a PDP-11/45-based version of Pogo is available now, "several features will be added to the language" prior to general marketing. The designers want to add more powerful declaratives, more powerful and general conditional forms, complex expressions and iterative forms, Allen said.

General marketing for various hardware systems is expected to begin early next year. Information about the PDP-11 version is available now from Computer Power Australia, Pty. Ltd., 244 Canterbury Road, Surrey Hills, Melbourne, Victoria 3127, Australia.

With Application Modules

Independent Library Backs Datasystem Users

HOUSTON – Managers of small businesses can handle most of their accounting on a DEC Datasystem 300 running under the Commercial Operating System by piecing together modules of the Computer Based Management System (CBMS) library from Innovative Management, Inc. (IMI).

The basic packaging of CBMS includes general ledger accounting, along with payroll recording, income and expense reporting and profit distribution routines. This package also provides inventory control on a percentage basis, preparation of financial statements – including supporting schedules – and a professional time analysis and billing subsystem.

Other modules, which can be used as stand-alone systems or as adjuncts to the general ledger accounting, include accounts receivable, accounts payable and a client/customer master list maintenance run. Systems for payroll calculation, fixed assets property control and sales analysis are under development, IMI added.

Billing and physical inventory systems are currently available but generally need so much tailoring to meet the user's specific needs that IMI does not treat them as products in the same sense as the other CBMS elements.

IMI's general ledger allows up to 800 general accounts with 900 subaccounts each, if wanted. The payroll routine accepts the results of calculations done elsewhere and generates employee pay stubs, 941A and W-2 tax records, as well as input to the general ledger.

The accounts receivable and payables systems are keyed to open items rather than balance forward processing. This is the way most of the small professional businesses IMI sees as CBMS users handle their books, a spokesman explained.

The professional time analysis and billing routine is likewise offered for that target group. It allows accounting for time and materials expended by project or job, so they can be charged back to the responsible client.

The basic CBMS packaging is available now for $10,500. The general ledger portion, along with payroll recording, can be had for $7,500. Related financial statements can be added for another $3,000.

The accounts receivable package is $4,000; the accounts payable, $4,500. The professional time analysis and billing system has a $2,500 price tag, and the client/customer master list routines can be acquired for $1,500.

IMI is at 7149 Fauna, 77017.

DPL Compiler Shows Data Entry Software Growth

UTICA, N.Y. – The need for substantial software support for "intelligent" data entry units – stand-alone or connected to a mainframe computer – has been reemphasized with the announcement of the Document Processing Language (DPL) compiler for the Mohawk 2300 Document Processing System.

DPL provides the Mohawk 2300 user with an ability to adapt the unit's logic to the formatting and editing needs of new jobs through creation of Form Description Programs. With companion file manager and communications programs, the DPL compiler permits an off-line network approach to terminal operations.

Unlike prior compilers or assemblers for the 2300, the DPL package utilizes a Mohawk 2400 ("which most 2300 users have anyway") as a host computer, rather than an IBM 360/370 or similar large-scale CPU. Thus, program development is closer to the actual data collection.

DPL users work on specification sheets that are similar in form to RPG coding forms – including file descriptions, input and output definitions and calculations. But the purpose of the resulting programs is quite different from conventional RPG, the company added.

The DPL compiler creates interactive, interpreter-driven programs used to edit and validate incoming source data, reporting immediately any errors encountered, good data accepted and control figures such as batch totals as they are determined. Normally, RPG is used to create batch-run jobs and archival-type reports, Mohawk went on.

Since the Form Description Programs are created on 2400s, duplicate copies of the compiled code can be sent to any number of 2300s being serviced by the 2400. This cuts down cost of program development and supports creation of uniform libraries of programs at all the 2300s, the spokesman noted further.

The DPL compiler package requires a 32K Mohawk 2400 as a host, but the satellite 2300s may be smaller than this and still be able to handle extensive programs. The control software includes support for paging program segments to and from disks attached to the 2300, and the limits of the real storage are transparent to the user.

"As with all our software," the DPL compiler and related utility programs are distributed free to Mohawk customers, the company representative concluded.

NC Code Guide Available

McLEAN, Va. – Software developers and users who must know the various character codes used to generate tapes for numerically controlled machines can keep track of the similarities and differences in the codes with a cross-reference chart from the National Machine Tool Builders Association.

Copies of the eight-page pamphlet are available for $2 each from the association at 7901 Westpark Drive, 22101.

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'Look' and Learn About OS

NEW YORK – By utilizing the Look command developed by Progressive Software, operators and their managers – working in an OS/360-370 environment – can learn more about the ongoing performance of their systems than is possible with the IBM-supplied Display Active (DA) command, according to the firm.

DA is a standard OS operator command that shows what jobs are in memory and what main storage they are occupying. It does not, however, show which jobs are active and which are standing still, which jobs are in loops and which channels are clogged.

Look adds perspective to the DA output, Progressive noted. It allows the user to get details on I/O and CPU usage, based on data samples collected at user-specified intervals. Working with the set timer, Look checks the Control Block 200 times before summarizing the findings in a console display.

The LOOK CPU output names each program in memory during the sampling period and shows what system resources (such as assemblers or compilers) are being used with the named jobs. The display also shows the percentage of the sample period each job was "using CPU," "waiting for CPU" and "waiting for I/O or work," and the priority of each job.

In similar fashion, the LOOK I/O report shows what percentage of the sampling period each channel and I/O device is utilized. The jobs that are using the I/O devices are listed, and the systems staff could use this information for better balancing of dats sets, the firm added.

The Look command coding has been installed on at least one user's CPU and is available now for $800 from Progressive, Box 31 Ansonia Station, 10023.

Better Management, Disk Usage Included in 'Panvalet' Update

OAK BROOK, Ill. – Version 8 of the Panvalet library system software from Pansophic Systems, Inc. provides improved program management and file protection, easier operation and more efficient use of disk storage space over previous versions.

The management functions have been modified to hold more information in the directory listing, to increase data set safeguards and to improve data set restoration techniques. The scan function in particular now operates more efficiently and has more information in its listing, the company said.

Both OS and DOS Panvalet systems support the IBM 3340 direct access storage device for the library file. Support for shared direct access units has been extended to DOS/VS under IBM releases 28 and 29.

At the same time, multiple partition protection has been extended to five partitions to take full advantage of that DOS/VS facility, Pansophic noted.

Other new features in Panvalet are said to include increased library compression, improved editing capabilities, a read-only access system, improved Cobol formatting support and increased exit opportunities.

Compression of Cobol key words is included as part of the approach used to save disk space. With any of the Cobol language formats available to the Panvalet user, this new compression amounts to about 20% or six byte/source card, a company source estimated.

Read-only access to either the active or backup library files is possible through the Panvalet Access Method (PAM). This logic allows access to the data sets without executing Panvalet maintenance programs.

PAM does not alter the original data sets in any way, the company stressed. On the other hand, the facility can be used to read whole or partial data sets from the Panvalet system for separate processing, Pansophic admitted.

The exit capabilities have been expanded. Exit routines may now be used with all Panvalet programs to inspect or modify any records read or written, or to add or delete records from any input or output file.

For the programmer's function, columnar updating and level stamping have been added to the system, the company noted.

Panvalet operates in 32K bytes under OS or DOS and can be licensed for a one-time charge of $15,000, Pansophic said from 1301 W. 22nd St., 60521.

'Helpme' Cushions RPG II Use on 360

TEANECK, N.J. – Reruns can be reduced and original test sessions made more effective for RPG II users operating on IBM 360/370 equipment with the Exit-Helpme package from Data Universal Corp.

The package consists of an Assembly language subroutine accessed through an Exit command anywhere in the user's own calculation specifications. The routine prevents the computer from prematurely canceling a run because of either data or program checks.

Instead, when an error situation is sensed, Helpme temporarily suspends user program execution and requests the machine operator to choose between a number of possible actions. What happens after that depends on the operator.

By providing flexible operator intervention, Helpme allows the RPG II programmer to skip his own coding of restart procedures to meet all possible error situations, the firm explained. It also avoids the chore of trying to debug a program after it has been dumped off the machine.

In operation, the Helpme logic fits into the calculation stage of RPG II program flow, checking for errors including bad collating sequence, undefined record type, record sequence, no record found, Halt indicator condition, Isam overflow, duplicate Isam and "the seven program checks."

Operator options include bypassing the errant data, accepting it, altering the computer memory, forcing normal end-of-job or terminating the job.

Even though RPG II is one of the major languages on the IBM System/3, Helpme isn't needed by those users, Data Universal noted, since facilities very similar to the ones provided by the package are already available through the control software of the S/3.

The Exit-Helpme package sells for $250 from Data Universal, 121 Cedar Lane, 07666.

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Just 'Mess'-ing Around

ENCINO, Calif. – IBM 1130 users who felt IBM's structural analysis program Stress was deficient in certain areas may find a better solution to their problems with the Maximum Efficiency Structural System (Mess) from Technology Enterprises, Inc.

Mess is three times faster than similar programs and has no dead time for small problems, the vendor claimed. Cards are checked for errors as they are entered and returned for correction without loss of compute time.

Loads can be given in local or global coordinates and a load may extend over several members. Mess computes the components for each member. Deadweight loading is generated. Other supports may be rigid or elastic – even supports sliding on an inclined plane can be specified.

Mess is written in Fortran for use on an IBM 1130 or similar CPU with a minimum of 8K bytes of memory and a disk. It can be acquired for $2,000 from 17835 Ventura Blvd., 91316.

Coding Can Be Costly

Modular Work Eases Program Design

By Michael Karmi

Special to Computerworld

Many Cobol programs are inefficient because they are merely coded, not designed. The time factor (which exists in every programming environment) forces the programmer to look for shortcuts, often bypassing the detailed preliminary design stage as a waste of time. This shortcut later may prove a very costly timesaving technique, but for the time being the program is ready for testing or implementation in a relatively short time, and management appreciates that.

In approaching the program design as a function apart from the system design, one should ask: What are the inherent characteristics of a good program? There are three major factors in making a good program: reliability, maintainability and extensibility.

While much work is needed to determine how best to design a program with these characteristics, there are already some techniques known that contribute to these aims.

Much of a program's complexity arises from the fact that the program contains many jumps to other parts of the program, both forward and backward in the code. These jumps make it difficult to follow the logic of the program and to know at any given point the conditions of program defined switches, flags and indicators or the value of variables.

As the program gets modified, the complexity grows alarmingly. Additional jumps are inserted. In some cases new code is somewhat redundant, just because the programmer isn't sure how the existing code works and is afraid to disturb the existing code for fear of undoing some of the program's necessary functions.

The result, after many modifications, is a program that is nearly unintelligible. Anybody, who ever tried to modify a program fully loaded with GO TO's and ALTER's will agree.

Logic Flow

The logic flow of such conventionally coded programs is determined by decision blocks as they are encountered during the program flow. The next processing step depends on conditions set internally by preceding steps of the program.

The alternative to the conventionally coded program is modular programming: the organizing of a complete program into a number of small units whose behavior is governed by a set of rules. Each unit – a module – has a single, defined function and one single entry and exit point.

Ideally, a module should be interchangeable to allow multiple usage in different programs. The behavior of the modules (subroutines in a Cobol program) is governed by the control module which represents the mainline logic of the program.

All decision blocks are contained in the control module which activates the processing modules (subroutines) in a sequence which is determined by the system-required condition settings. Each module has a single entry point and exit point so once the module is activated by the control module it will be executed completely.

Let us examine next how this modular structure will contribute to the three major factors of good programming.

- Reliability. The control module contains all the controls required by the system designer. It is compact in size and therefore easily readable and understandable and can be improved – independently of the other program modules – until it meets all system requirements. A very effective method of developing such control modules is the usage of decision tables and decision table translators, but details of those tools are outside the scope of this article.

In any case, the limited size of the individual modules and the simplicity of their coding are other contributions to the reliability of the final product.

Maintainability

- Maintainability. When the need arises for program maintenance because of program failure or new user's requirements, any one of the modules, including the control module, could be modified or even replaced without affecting the performance of any of the other modules.

Such maintenance could be done by a programmer who is not completely familiar with the program logic as a whole. Usually any maintenance will be limited to one, or at most, to some clearly defined modules.

- Extensibility. Since the modular program is a structure of independent building blocks (modules), an extension of the program means the development of additional modules and the modification or replacement of the control module. Thus, we can incorporate new functions into existing programs and at the same time be sure that the program will fulfill its previously defined functions properly.

While modular programming represents a specific technique to meet specific goals, it also represents some first steps toward a deeper understanding of the intrinsic nature of programming and of the factors which distinguish "good" from "not-so-good" programming.

We can expect future programming projects to contain higher on-line elements, to require larger programs and have a greater degree of complexity. Modular programming has been found to be an aid to meeting all these needs.

Michael Karmi is a programmer analyst with Worthington Compressor & Engine International, Information Services, Buffalo, N.Y.

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COMMUNICATIONS

Four-Phase Systems intelligent remote batch system includes card reader, printer, CRT terminal and disk storage.

Four-Phase Remote Batch Features Disk Spooling

By Patrick Ward
Of the CW Staff

CUPERTINO, Calif. – Four-Phase Systems has announced a line of intelligent remote batch systems that provide for disk spooling, stand-alone Cobol processing and expansion to up to 22 CRT keystations for data entry.

The remote batch systems are based on 24-bit Four-Phase processors and are compatible with IBM 2780, 3780 and multileaving Hasp RJE terminals. The operator can select these operating modes through keyboard entries. The systems transmit at up to 9,600 bit/sec on either point-to-point or multipoint nets.

Peripherals include 300- to 600 card/min card readers, 300- to 1,800 line/min printers and either a 354K-byte diskette or 2.5M byte cartridge disk drive for program loading.

Operators control and monitor system and job status through a 1,152-character video console.

The disk spooling capability allows the system to concurrently handle independent job streams on the card reader, printer and communications line. The system could receive batch data at night at 9,600 bit/sec, store it on disk and output it on a 300 line/min printer the next day, the firm noted.

A Four-Phase spokesman said he expects the systems' Cobol capability to be used mainly for pre- and postprocessing, including editing and generation of immediste management reports before the data is transmitted to the remote site.

He added that the systems could also function as stand-alone small business machines but that their file capacity on disk is too limited for permanent storage of master files. The systems do not offer tape support.

The remote batch systems are field-upgradeable and support all of the firm's software, which is offered without charge, Four-Phase stated.

A typical diskette-based system with a 300 card/min reader, 300 line/min printer and video control console costs $865/mo on a one-year lease. The disk-based system with spooling capability and the same peripherals costs $1,140/mo.

First deliveries are set for the fourth quarter of this year from the firm at 19333 Vallco Parkway, 95014.

With Nightly Diskette Transmissions

Multidivisional Firm United by CRT-Based Net

By C.H. Crockett Jr.
Special to Computerworld

HARTSVILLE, S.C. – A computer communications network, linking together the multiple locations and divisions of a diversified manufacturing firm, has produced a series of benefits for Sonoco Products Co. well beyond the usual time and labor savings associated with automation.

Our 6,000 employees work in more than 40 plants and distribution centers nationwide, producing and shipping cones, tubes, spools, cores, composite cans, forms, pipe, folding cartons, paperboard, plastics, chemicals and scores of other products.

Because of the variety of products and customers Sonoco serves, one of the first and most critical company areas for the expansion of computer utilization was in credit and accounting.

To support the financial side of the house, the company developed a network of IBM 3270 visual display terminals to give credit representatives and customers current and complete analyses of accounts.

While in the past invoice information was keypunched into unit records and sorted by hand to answer inquiries, all invoice information today is stored in computer-usable form and made available on the screen of the 3270 display unit.

When a customer wants to know the status of his account, he merely calls the corporate credit department here in Hartsville and a credit analyst enters the customer name or identification number into a terminal. This enables the firm to answer a question – or a series of questions – while the customer is still on the telephone.

The system also facilitates solutions to receivables problems by allowing Sonoco to hold up order shipments on a moment's notice to the corresponding accounts.

Cash Processing

Complementing the credit and invoice inquiry system is the firm's new cash processing system.

In the past, the company processed payments in the traditional manual manner. The final step was to keypunch receipt information into cards that were used to update accounts the following evening.

Now, when customers pay Sonoco, their checks are sent to a lock box bank which deposits them and reports back daily the customer check identification and amount.

The information is displayed by a Sonoco clerk at the keyboard of the 3270. The computer associates the customer's Micr check number with the firm's master number and displays on the 3270 screen all the invoices outstanding for that customer.

The clerk then applies dollar amounts against invoices, as indicated by the customer on the check stub, and the computer stores all the transactional information for processing during the nighttime master file updating run.

Because all customer information is accessible directly at the terminals, Sonoco uses a 3270 display unit in its sales system support area. Working on-line to the computer, clerks there can answer customer inquiries and make changes to the customer's information file. Instead of waiting for a nightly processing cycle,

(Continued on Page 16)

IBM 1800s Interfaced to 3270s

PHILADELPHIA – Fortran programmers working with IBM 1800 computers running under MPX, version 3 mod 3 can interface with IBM 3270 information display systems by using the CRT 1800 software package from Sun Computer Services.

The package is composed of two groups of subroutines, Sun explained. One group establishes 3270 order sequences (set buffer addresses, define fields, etc.) and converts output data from floating point or integer format to Ebcdic.

This group of subroutines also aids in identifying 3270 input data fields and converts input data from Ebcdic to the appropriate internal 1800 format, in addition to preparing for transmission of an output message to a 3270.

The second group of subroutines forms a communications control system consisting of a routine to support 3270s and the 1800 as a master station in a multipoint network, a subroutine to poll the individual 3277 CRT stations and other subroutines to output user messages. During polling, Sun noted, the 3277 input is received in an Inskel common buffer and a user program is alerted. During output, a user message is transferred from program control to an Inskel common buffer and transmitted to the desired device.

If the Inskel buffers are in use, the output is written on disk and retrieved later for transmission when buffer space is available.

Core requirements to implement the system include 100 words of Inskel common, and input, output and disk buffers; approximately 3,800 words for the System Executive; three words of program common, plus output buffer size; and 950 to 2,800 words to accommodate application programs.

Sixteen 3277 display stations and 16 3284/86 printers can be supported by a 3271 control unit. Currently only one control unit is supported by the Sun package, which is available for $6,000 per 1800 CPU from 1608 Walnut St., 19103.

Singer RJE Terminal Linked To Burroughs Mainframes

ORANGE, Calif. – Singer-M&M Computer Industries, Inc., a Singer Co. subsidiary, has introduced a Burroughs DC 1100 emulator package that allows its Series 500 RJE terminals to communicate with Burroughs mainframes, from the B2500 up to the B7700.

Other modules enable the terminal to emulate the IBM 360/20 multileaving workstation, the CDC UT200, the Univac 1004 Phase II and RMSI, the IBM 2780/3780 and the GE DN30 and 355 terminals, according to the firm.

The Burroughs DC 1100 emulator module is free to Series 500 users, according to a Singer-M&M spokesman.

Base price for the Series 500 terminal is $675/mo, the spokesman noted. The emulator module is available on cards from the firm at 2201 North Glassell St., 92665.

The *quiet*, reliable AJ630

The AJ630 is a solid state, non-impact printer terminal that has a lot to offer— • speeds up to 30 cps • prints 140 characters to a line • holds a 15", 400' roll of paper • provides all 128 ASCII characters • two character buffer, plus options such as internal modem for DAA or acoustic coupler. There's a lot more in our 4 page brochure, it's yours for the asking.

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CRT-Based Net, Diskettes Unite Multidivisional Firm

(Continued from Page 15)

master records are changed immediately, saving time and making the company more responsive tò the needs of its customers.

In like manner, terminals in the supplies areas enable Sonoco to closely manage its master supplies and steel stocks for machinery manufacturing. Involved is $1.5 million worth of basic supplies and the special grades of steel used in making machines invented and built by the company. By accessing the up-to-date inventory records, clerks can instantly determine the exact status of any of 12,500 items – amounts on hand, on order, average use, use to date, cost, last in/out activity, etc.

IBM 3740 data entry terminals are located at 13 branch plant locations to transmit payroll and order entry information to the Hartsville 370/135 and to handle work orders and paychecks that are printed back at the plants.

Initially, the company used the 3740 system for payroll processing to gain experience with it. On a daily basis, worker hours, earned hours, overtime and other data is compiled. Weekly, at night, the computer staff dials up each 3740, extracts the data from it onto a magnetic tape, and the data is entered into the 135 for processing.

The remote sites batch their day's transactions onto diskettes and this data is then transmitted during off-hours to the central site. Between 5 p.m. and 6 a.m., the central site dials up the remote locations, and the data stored on the diskettes is transmitted to one of two 3747 data converters at the central site.

The data is transmitted at 1,200 bit/sec on Wats lines, and reports for the remote site are transmitted back in the same manner. Integrated IBM modems are used with phone company Data Access Arrangements at each site.

The data converters generate a magnetic tape output which is then manually mounted on the firm's 370/135. At present, the system operates off-line and is handled by computer operators during the second and third shifts. If the volume of transmitted information increased to the point where operators would have to be hired specifically for the data network, then the remote sites would probably be put on-line directly into the 370, a company spokesman said.

With the current off-line network, the CPU processing is usually completed at about 5 a.m., giving the operators two hours to get the data transmitted back to the remote sites, before the Wats network is again dedicated to voice and administrative traffic when the morning shift arrives for work.

The CPU prepares a reply tape which is transmitted back to the local terminals the night before checks are to be printed. In the morning, a clerk at the plant merely has to feed continuous-form paycheck blanks into the 3740 printing unit, and it power-types paychecks and stubs for the plant's workers.

Over 1,900 hourly personnel are employed at the Hartsville complex, and all are paid on a weekly basis. Payroll clerks daily enter clock hours, earned hours and account numbers to the computer through 3270 terminals.

Extensive editing is performed to insure the data is valid and is applied to the correct employee's record. Each night backup files are created and the on-line files are prepared for the next day's input.

At the conclusion of the work week, the system computes all payroll extensions, considering holidays, overtime, makeup, etc., and produces the employee checks and all related accounting reports.

Previously, this job took many hours to enter manually. Worker time cards had to be verified by industrial engineering staff members who identified which clock hours were earned hours. They also made overtime authorizations, which had to be calculated manually, before payroll data could be keypunched and verified and entered into the computer.

Order Entry Speeded

Having the 3740 terminals at branch plant locations also facilitates order processing. The same floppy disks that capture payroll dats each shift also are used to gather basic order information.

When an order arrives at the plant, clerks only have to record customer identification, an item identifier and quantity information. This data is transmitted at night to the 135 which automatically translates the item code into a customer acknowledgement and a manufacturing work order describing the item in detail. Customer ID numbers generate name and address information on the forms and any special handling and shipping instructions.

In the morning, the terminal operator mounts the proper forms on the 3740, enters a code for printing the proper output and waits as it produces the necessary documentation. Each order is handled as a unique transaction. The firm maintains no inventories of customer items, preferring instead to manufacture to firm orders.

Local management profits from the fast turnaround of all information. Sonoco transmits both to and from the computer at night, thereby helping to absorb the workload without adding people, purchasing new Wats line capacity or expanding the size of its computer.

It is important to note that the company's system was not designed to reduce clerical activity, but rather to supply management with the information it needed to do a more effective job, to respond more quickly to customer needs and to capture information in computer-usable form at the lowest level possible in the organization.

The computer-based system was not designed to force-fit into the business, it was designed to complement a customer-oriented multidivisional company.

C.H. Crockett Jr. is systems and programming supervisor at Sonoco.

Multiplexer, Interfaces Combined on One Board

PISCATAWAY, N.J. – Computer Interface Systems, Inc. (CIS) has a serial line interface module (Slim) board that combines eight duplex asynchronous serial line interfaces, a multiplexer and a computer interface on one PC board.

Designed to plug directly into an Omnibus card slot, the module is compatible with the DEC PDP-8/E Series.

Each serial channel is double-buffered and jumper-selectable for word length, parity and stop bit options. Transmit and receive frequencies are individually jumper-selectable from 12 crystal-controlled and three adjustable frequencies ranging from 50- to 9,600 bit/sec. Serial line inputs and outputs are EIA-compatible.

The price is $1,980 with delivery about 60 days.

The CIS address is Box 58, 08854.

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On-Line Inventory Access Fills Firm's Demand for Timely Data

NCR 260 thermal printers installed at two Tide Equipment sales offices and yards provida on-line access to current inventory file.

HOUSTON – At Tide Equipment Co., a contractor equipment rental services firm with 1,000 inventory items spread over three cities, timely information is crucial to daily decision-making. That is why, after seven years with a service bureau, it decided to set up its own data processing department.

At the outset, the most important consideration was the need for fast access to timely management information on demand at reasonable cost.

The first installation, made in August 1972, was an NCR Century 100. In September 1973, the firm upgraded to a disk-oriented NCR Century 101 system. This system has 64K of core memory and can place nearly 10M characters of information stored on removable disks on-line to the processor.

Costs are about the same as with the original computer, but the new system provides an advanced communications system, noted Bill Jones, manager of DP services. One terminal is installed in the president's office; two other terminals are at the Baton Rouge, La., and Houston sales offices and yards.

The last two units are tabletop NCR 260 thermal printers, which were selected to provide these facilities with a capability for hard copies, Jones said.

With access to a terminal, a salesman keys in the list of equipment needed by his customer. The CPU accesses the inventory disk file and sends an instant reply over telephone lines to the thermal printer. The reply is printed at the rate of 30 char./sec using Bell 103 F data sets on dial-up Wats lines.

The salesman can immediately tell the prospective customer what is available, where it is, what it will cost and when it can be delivered. Two of the largest sales offices already have this capability, and the other three currently work through them, Jones explained.

When it installed the new computer, the company also reorganized the data processing department as a separate company – the Mechdata Corp. Only utilizing 20% of the Century 101 system's capability, it was felt it would help to underwrite the cost of the in-house DP operations by selling payroll, accounts payable and similar DP services to other companies.

This turned out to be a profit-making venture, Jones said. Within a half a year, billings were between $9,000 and $10,000 monthly, and a three to four times increase is projected while continuing to do the work that Tide requires, he added.

The 101 CPU has 64K of storage in two partitions with four type 656 disk devices, an integrated multiplexer, the thermal teleprintera and CDC display terminals.

Mechdata is only a two-person operation. All of the financial information flows from the sales offices and yards to headquarters. Payroll information for hourly employees is sent biweekly in the form of itemized time cards. These are coded to indicate how the employee spent his time.

After this information has been edited for accuracy, it is punched onto cards which are fed into the mainframe at the rate of 300 per minute. This information is stored on the disk to update the payroll inventory and general ledger files.

The same procedure is also followed for preparing and entering all sales, rental and cost information to the file. Thus, a sales report provides the information needed for writing commissioned salesmen's checks and also for updating the general ledger and inventory files.

Payables information is used to update the appropriate files, and checks are written under the guidance of an exception routine that assures that all cash discounts will be taken, Jones noted.

Itemized invoices are printed out weekly, and monthly statements are also sent. In addition, every 30 days the line printer used with the 101 prints out an aged analysis report of receivables with unpaid accounts listed in separate columns for current, 30-day, 60-day and 90-day and longer overdue.

The same type of detailed data is available on equipment inventory, Jones went on. A monthly report lists each item and its location, along with its book value, depreciation reserve, original cost, date purchased, book life, remaining life, who has it rented, its unit number and an itemization of expenses and income for the current and two previous years.

The last item includes costs for tubes and tires, labor, parts, depreciation, earnings and the exact profit or loss at that time. With this type of detailed and timely data, every decision management makes regarding each item of equipment is based strictly upon what it can do for the firm, Jones asserted.

"We also get the bigger picture," said James L. Beeson, president of Tide. "We can spot trends when categories of equipment show profit or loss spirals, and we can make decisions accordingly. Meanwhile, the same historical file used to prepare these reports is updated every time a new computer entry is made regarding a piece of equipment."

"When we access the computer file through one of the terminals about the availability of that piece of equipment for sale, its book value is updated to the minute," Jones said. "But factually that hasn't been the most important type of information accessed from the files. The real breakthrough for us, so far, has been the ability to quickly pinpoint the location and availability of every piece of equipment we own on demand."

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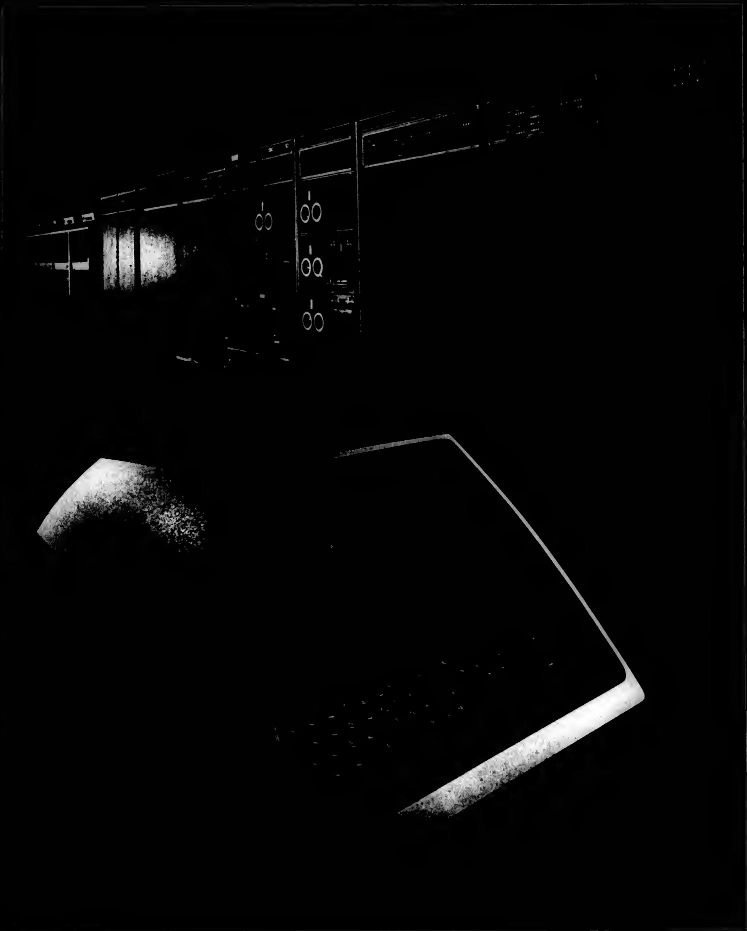

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All of which means you've got to investigate the DECsystem-10 anytime you have a situation where a number of sources need the computer at the same time. As in networks. Or hierarchies. Or any mix of batch, program development, EDP, timesharing, or real time.

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digital

Pen Movement Writes, Inputs Source Data

By Don Leavitt
Of the CW Staff

SUNNYVALE, Calif. – Input operations take on new forms – or rather new combinations of old forms – for users of the Alphabec-70 data entry system from Xebec Systems Corp.

The basic unit of the system, developed by Stanford Research Institute, is a ballpoint pen with which the operator writes original source documents. Circuitry within the pen senses movement up, down, right or left and generates signals which are translated by a desk-top unit into Ascii code.

For verification, the system provides both an audio reading and a digital display of each character as entered. If the character is correct, the operator goes on to the next.

If, on the other hand, the system has misread the written character, the operator can delete it with a short pen stroke. The audio readback says the word "erase," the faulty entry is eliminated from the digital display and the operator can then reenter the character.

Once the digital display is filled, with as many as 96 characters in one model, the operator moves the data to storage within the Alphabec control unit or to a cassette attached to the unit. Alternatively, it can be transmitted directly to a computer for processing.

Version I of the data capture unit recognizes 16 characters, including the numbers 0 through 9, "erase," "space" and four special control codes. These codes may be arbitrarily assigned and may be "personalized" by the installation, Xebec said. They may be unique in shape as well as Ascii code, a spokesman added.

Version II has the same capabilities but may also be programmed to insert repetitively needed data fields and to provide logical data validation checks against operator entries. This version will normally be application-dependent, the vendor noted.

A potential for 22 special "control" characters, again user-definable, provides partial alphabetic input capability, Xebec's spokesman admitted. All the user need do is define hand-printed letters as control codes and provide the proper Ascii bit patterns for creation of the data to be stored.

Since these would be treated as control characters, however, it appears likely the audio readback and digital display capabilities of the system would not be available for verification of the entries.

Three configurations are foreseen by Xebec. In order entry situations, a number of pen-and-control-unit stations can be clustered around a minicomputer for processing the data there or gathering it together on tape or disk for later transmission to a mainframe.

Xebec pen inputs data.

In more scattered but still fixed location operations, a pen and control unit can be linked to a computer through an acoustic coupler and data can be passed over telephone lines.

Still under development is a completely portable system that would be suitable for data gathering chores such as meter reading.

In the clustered situation, Xebec said, the cost will be about $150/mo per station including the mini in the middle of the cluster. The stand-alone "station" (including pen, recognition circuitry, small memory, audio and digital display and communications capability) will cost $3,500.

The first systems will be ready for marketing early in 1975, Xebec said from 566 San Xavier Ave., 94086.

CMC 3 Key-to-Disk Unit Offers Up to 8 Stations

By Vic Farmer
Of the CW Staff

MARINA DEL REY, Calif. – Computer Machinery Corp. (CMC) has pared down its CMC 5 key-to-disk CPU to come up with the smaller, less expensive CMC 3 data entry system.

The CMC 3 doesn't have the removable disk of the CMC 5, nor does it have the one-character panel display option.

But a CMC 3 user with eight keystations will pay $100/mo less than a comparable (features and compatibility) CMC 5 with eight stations.

The CMC 3 will run all the programs of the CMC 5; the major difference is that the CMC 5 user can upgrade to 16 stations while the CMC 3 user is limited to eight.

To make the CMC 3 even less costly to the smaller user, the firm has classified some of the standard features of the CMC 5 as separately priced options on the smaller CMC 3.

A standard CMC 3 has disk capacity for temporary storage of 6K 112-character records. Through field modification, disk storage capacity can be tripled to 18K records, CMC said.

Standard system hardware consists of a supervisory console, a Teletype KSR 33 and three CRT keystations that display 112-character records.

The supervisory console houses the system computer, magnetic disk unit, control electronics and a choice of a 7-track, 550/800 bit/in. or a 9-track, 800 bit/in. magnetic tape unit.

Optional hardware features include an 18K-record disk capacity and 1,600 bit/in. magnetic tape drive. Either a 115- or a 300 line/min printer is available for hard-copy output.

Optional software includes programs for check digit control, data validation, output reformatting, entry of batches onto disk through magnetic tape and the accumulation of statistics on operator performance.

A standard CMC 3 system with three keystations rents for $500/mo on a two-year contract and sells for $20,000. Deliveries will begin in the third quarter of this year. Additional keystations are $70/mo.

The CMC 3 system can be upgraded to a remote job entry satellite system that is compatible with IBM 2780 terminals under Hasp.

A communications-based CMC 3 is called a CMC 5780 and data accumulated on the CMC 5780 can be automatically transmitted to a host computer or to any terminal operating under 4,800 bit/sec or less binary synchronous communications speeds. Data can be returned from the host CPU and printed on the 5780 line printers.

A standard 5780 also includes system programs, software for basic communications and data entry functions, three video keystations and a Teletype KSR 33.

The teleprinter is used for system control; statistical analysis of communications system performance; and hard-copy audit, status and operator performance reports.

Monthly rental for a standard system is $965 with a 115 line/min printer and $1,145 with a 300 line/min printer. Corresponding purchase prices are $36,800 and $44,800.

CMC is at 2500 Walnut Ave., 90291.

Singer Series 110 Minicomputers Aimed at Small Business Users

SAN LEANDRO, Calif. – Singer has announced a small CPU that will serve to broaden the low end of its System Ten business computer family. The CPU can be configured in four basic systems – the 110-1, 3, 4 and 5 – and the prices of this series range from $25,000 to $67,000.

The basic building block of the series is the Model 24 CPU, which provides 20K characters of core memory and one I/O channel.

The channel speed is double the speed of the older System Ten processor, the Model 21, but the firm has slated modifications and upgrades for the 21 later this year. The 21 CPU is the basis of the larger System Ten systems.

The 110-1 has a 20K-character memory, one I/O channel, an 8M-character disk, a 25 char./sec keyboard/printer workstation and is priced at $25,000.

The 110-3 replaces the workstation with a 1,920-character CRT terminal and a 165 char./sec matrix printer for a total price of $34,800.

The same processor used by the 110-1 and 110-3 is linked to an expansion module in the 110-4 and 110-5 configurations. The module provides additional core storage and three more I/O channels.

This added computing power provides multiprocessing capability. Performing up to three tasks simultaneously, the systems can thus accommodate high-volume user applications, according to Singer.

The standard configuration of the 110-4, priced at $43,400, has 30K characters of core storage, two I/O channels, an 8M-character disk drive, CRT terminal and 100 line/min printer. This configuration can be expanded to include an additional 10K characters of core for a total of 40K, two more I/O channels, two more CRTs and a 200 line/min printer upgrade.

The standard configuration of the 110-5, selling for $66,600, includes two CRTs, expandable to three, and a 100- or 200 line/min printer. It has two disk

(Continued on Page 23)

96-Col. Card Unit Interfaced To Cincinnati Milacron Mini

LEBANON, Ohio – Cincinnati Milacron has interfaced the Model 9610 Decision Data 96-column-card Data Recorder to its CIP/2200 minicomputer system. The card reader/punch is priced at $11,300.

A single PC board interface plugs into either the CIP/2200 mainframe or an expansion chassis. A self-contained read-only memory automatically performs the conversion of data from Ascii to six-bit card code and vice-versa.

For data output to the device, the controller expects a 64-character subset of the seven-bit Ascii code from the CPU. Bit seven of the output data byte from the CPU is ignored.

The firm is here in Lebanon, 45036.

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DP DIALOG

Notes and observations from IBM which may prove of interest to data processing professionals.

DP DIALOG appears regularly in these pages. As its name suggests, we hope DP DIALOG will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP DIALOG, IBM Data Processing Division, White Plains, N.Y. 10604.

Management of a two billion dollar construction program—including new nuclear power stations like this one in Waterford, Connecticut—is one of the applications under development at Northeast Utilities, a VS2 user.

Peak Computing Power for Northeast Utilities

To meet the growing demand for energy among its customers, Northeast Utilities, serving Connecticut and Massachusetts, will invest $2 billion in capital construction over the next 6 years.

To meet its own growing demand for computing power, and accommodate an ambitious information systems development plan, Northeast has already invested in dual System/370 Model 158's with OS/VS2, the virtual operating system which is the compatible extension of OS/MVT.

Through its three major operating subsidiaries, Connecticut Light and Power, Hartford Electric and Western Massachusetts Electric, Northeast serves nearly 1.2 million customers. A fourth subsidiary—Northeast Utilities Service Company—provides such services as personnel, purchasing, engineering and data processing to the operating units.

Explaining the selection of VS2, data processing manager Albert Schmitz says: "Since the company has been formed out of several separate entities, one important consideration was the need for a common, company-wide operating system capable of absorbing a variety of application programs and steadily increasing workload, while providing a foundation for growth."

The two Model 158's, which form the nucleus of Northeast's data processing operations, were both installed as VS2 systems. Installation of the first—over Veterans' Day weekend in 1973—coincided with the move into a new datacenter. The second was installed last February.

"The initial conversion was relatively trouble-free," Schmitz recalls. "Before the conversion, we spent several months testing application programs on a VS2 system at IBM's Boston datacenter. When the actual changeover occurred, we were able to run production work immediately—and we haven't looked back since.

"One of the most important advantages of VS2," Schmitz notes, "is better memory management. Where once we had to carefully weigh memory size, the number of tapes and availability of disk before running a job, operators now can concentrate on tape allocation. We've been able to open up the system and let the flood pour through. Over the first few months, throughput went up 50%, to 15,000 jobs."

In addition to current production work in payroll, personnel, purchasing and general financial applications, Northeast is also engaged in developing a comprehensive, company-wide information system. Understandably, construction management is a primary objective; so are an on-line customer service system and financial modeling capability.

Schmitz notes, "VS2 also offers our systems programmers much greater flexibility. They can now page libraries in and out and make modifications without affecting production.

"And our development programmers, who work with RJE, say they've never seen turnaround like it. Before, they counted their blessings with a once-a-day test shot. Now, they're used to once an hour."

Don Anderson, Northeast's director of systems and processing concludes: "VS2 is an effective way to handle the growth we anticipate—as a company and a data processing organization serving that company. We're confident it will make the progress of both a lot smoother and easier in the long run." **IBM**

Data Security: What IBM is doing

The evidence is clear: in the halls of Congress, in the editorial pages, in the proposals of public interest groups, and in the appointment of Vice President Gerald Ford to a top-priority Domestic Council Committee. There is a new urgency surrounding a timeless question: how to safeguard the right to individual privacy.

Defining what information is to be collected and who is to have access to it is the province of citizens acting through their government. But congressmen, citizens and the data processing community all recognize that data security as a day-to-day practice can make a major contribution to the protection of privacy as a social and legal principle. If the computer's incredible speed and prodigious capacity have the potential for misuse, that same technology also holds out the promise of protecting data far more effectively than any manual record-keeping system.

In 1972, IBM made a public financial commitment to the continuing study of data security and development of appropriate safeguards for its products.

Part of that investment went for a two-year joint study with three outside users; IBM also enlisted the help of its own Federal Systems Division, which served as an experimental control point. The groups completed their work this spring and the results will be placed in the public domain. The publications which will be available through IBM branch offices include six volumes: an Introduction and Overview of general interest; Study Summary; and in-depth technical papers from each of three principal study sites which will be of specific interest to particular audiences.

With their findings the study groups helped to advance data security from dialog to disciplined study and documentation, an essential step in finding workable solutions. In addition to a basic contribution to the literature on the subject and a foundation for future data security research and development, the studies also provide some practical, field-tested guidelines for immediate use.

At the State of Illinois, the emphasis was on detailed guidelines that other users can apply. A privacy action plan, for example, advises senior executives to establish what data is being collected, identify who needs it and why; assign an economic value to the data and qualify its worth to outsiders; review the probabilities of disclosure; and budget accordingly for security-related costs.

TRW Systems reported on a list of 187 requirements which could be used as a guide to determine whether a system is acceptably secure. They include five major areas: separation of programs and data, controlled access, identification, surveillance, and hardware and software integrity.

Massachusetts Institute of Technology considered the problem of authorization and delegation. While each study site installed IBM's experimental Research Security System, a software addition which made their operating systems more secure, MIT modified a procedure that previously allowed only a security officer to decide who could use or alter a particular set of data. By giving much of this authority to the creator of the data set, MIT was able to accommodate constantly changing relationships between users and data while enhancing security in their time sharing system.

At the same time, IBM has continued to work to make available a number of data security and integrity safeguards designed into system architecture and built into equipment itself. They range from special features like keylocks on terminals and other devices, to magnetic-stripe card or password identification, to high-level integrity in IBM's most advanced operating system, VS2 Release 2. Future IBM products will continue to stress provisions for data security as a formal engineering and design criterion.

Such safeguards are only tools, however. As Dr. Lewis Branscomb, IBM's chief scientist, noted in testimony before a special congressional committee, to be effective, they must be part of an over-all commitment to data security on the part of the data processing user, beginning with such fundamentals as locked doors, trustworthy people and conscientious supervision, and including controls like division of responsibility and periodic audits.

"There is no such thing as perfect security," IBM's chief scientist cautioned. "But," he added, "an appropriate level of protection can be achieved." **IBM**

First System/370 Model 115 to Ski Distributor

Beconta Inc. of Elmsford, N.Y., the largest privately owned importer and distributor of ski equipment in the United States, has become the first in the nation to install the System/370 Model 115, the smallest member of the 370 line.

"The growth of our business in recent years is the main reason for our installation of a Model 115," says president James Woolner. "We needed a versatile system that would help us respond to customer demand for the quality lines we distribute."

Karl Wallach, treasurer and chairman of the board, adds: "We feel we're building for the future since the Model 115 gives us room to grow. This flexibility is something that only a virtual system can provide."

The firm is the U.S. distributor for such products as Nordica ski boots, Volkl skis, Look ski bindings and Puma footwear. In addition to its own headquarters and distribution center in Elmsford, Beconta operates distribution facilities in South San Francisco, Denver and Waco, Texas.

The Model 115, installed at Beconta in early April, replaces a Model 20. Woolner reports, "We can now take care of current business quickly and efficiently in addition to planning for other applications which would have been impossible before."

Beconta is using the Model 115 for such tasks as accounts receivable, accounts payable and inventory for part of the firm's sales line. In the future the company hopes to use the system for credit transactions, inventory of the entire sales line and sales forecasting.

Because Beconta's business is seasonal and international, the job of collecting and analyzing information is more complicated than in many other businesses.

DP manager Dennis Hickey and controller Catherine Thomas confer on orders for the ski equipment their company distributes.

The ordering cycle typically starts in late winter or early spring when buyers attend trade shows and place orders. Ski shops in metropolitan areas generally receive delivery of merchandise from July through September—those in ski areas from October through December.

Catherine Thomas, Beconta's controller, emphasizes: "It's very important we take these delivery times into consideration along with production schedules in the countries producing the goods. At the same time we have to calculate fluctuations in exchange rates.

"Another area we hope to get into is forecasting," she says. "We do a good job of it now, but we expect to do even better when we can develop on the computer a detailed history of past buying patterns."

Installation of the Model 115 went "as smooth as silk," according to Dennis Hickey, Beconta's data processing manager. "Conversion was impressive in both speed and accuracy. The task—involving the transfer of data from disk to tape to disk—took about three hours from start to finish.

"The way things went, we feel confident we can add additional applications just as readily. We look to the day when we will have an integrated management information system up and running." IBM

Dr. Sayre examines the structure of the protein, rubredoxin, on this electron-density map.

10,000 Equations and 15 Hours Later

It usually takes microseconds—perhaps as long as several seconds—for the computer to solve most problems. However, Dr. David Sayre of IBM waited almost 15 hours as a System/360 Model 91 computed the answer to his particular problem—a problem a team of scientists once worked two years to complete.

A mathematician at the T. J. Watson Research Center, Sayre has been engaged in refining the structure of a protein called rubredoxin. Beginning with an X-ray map at a resolution of 2.5 angstroms, Sayre used the Model 91 to process a complex system of more than 10,000 non-linear equations—one of the largest equation systems ever programmed for computer solution. A critical technique he employed, called conjugate gradients, was developed by Professor Magnus Hestenes of UCLA and was adopted by Sayre at the suggestion of a research center colleague, Dr. Philip Wolfe.

With the computation completed, and the resolution mathematically refined to 1.5 angstroms—about the distance between the centers of neighboring atoms—Sayre was able to identify some 400 of the protein's 424 non-hydrogen atoms.

In significantly reducing the computation time required for such high-resolution studies, Sayre's work may lead to improved understanding of molecules like DNA and RNA, key elements in the reproduction of human cells. IBM

Computers Aid Scientific Study Groups Worldwide

In countries around the world, IBM Scientific Centers are experimenting with new ways of applying the computer to the solution of social, economic and technical problems.

In forming unique study groups with academic and government partners, the centers provide facilities and people with computer and scientific skills; the study partner provides experts of its own. Together, they decide what projects are most important and which will help the greatest number of people. Among those underway: studies of air pollution in New York, a sinking lagoon bed in Venice, feeding a growing population in Mexico.

Advanced approaches and ideas are already at work for business and industry. Today international scientists are applying the same powerful instrument, the computer, in coping with the more subtle problems of people and in keeping pace with the rapid changes which are shaping our future.

The Future of Venice

A study team with members drawn from IBM and Italy's National Research Council is preoccupied—as are many people—with the future of Venice.

Aqua Alta, or high water, is a phenomenon that plagues the City of Canals. A product of storms in the Adriatic, Aqua Alta floods the Venetian lagoon many times each year. The problem is further complicated because the lagoon bed on which Venice rests is sinking year by year.

To study the complex interaction of wind and water and tides, a seagoing laboratory belonging to the National Research Council is collecting data the study partners can incorporate into a computer model of the problem. With a mathematical substitute for the real situation, team members can test different theories and hypotheses.

One paradox has already been resolved: Venice is sinking because water is disappearing beneath it—drawn off by the fresh-water wells which supply a nearby industrial area.

It is not likely that the sinking will soon stop, or that Aqua Alta will cease to be a threat. But the study is giving scientists a clear analysis of the forces at work on Venice.

Breathing Easier in Manhattan

Curbing air pollution in New York City and other large industrial urban areas is an unending battle. But IBM scientists have enlisted the help of the computer in the fight.

This is a computer-generated picture of the sulphur dioxide buildup over Manhattan at 6:00 p.m. when it's at peak concentrations. When data on pollutants in the air is combined with values for every known atmospheric condition, the result is a numerical picture of air above the city.

Thousands of such pictures, calculated by the computer as a changing flow of information, make it clear where air pollution is coming from and where it is going.

The Manhattan air pollution model is a prototype developed by the Palo Alto Scientific Center in California.

More Food for Mexico's Millions

Like many other developing nations, Mexico is faced with the problem of feeding a growing population while also cultivating crops for export.

Collaborating with the National Agricultural College, the IBM Scientific Center in Mexico City has tackled the job of developing a computer model of the agricultural economy. Its purpose is to allow planners to see the results of their decisions before they are committed to action. Among the "what if" questions they are attempting to answer: what are the implications of planning for more machinery in a certain area; what is the effect of substituting a crop for export, like an oil seed, for the basic staple of the local diet—corn.

These are important questions, and the computer is helping researchers to get accurate answers.

IBM.

74-4

Optical Document Scanner Added To Entrex 480 Key-Disk System

BURLINGTON, Mass. – Entrex, Inc. now offers an optical character reader manufactured by Computer Entry Systems, Silver Springs, Md., as an option for the Entrex 480 key-to-disk system.

At the price of $28,320 or $680/mo on a three-year lease, the 720 optical document scanner reads OCR A numerics and vertical bar data. Documents pass through the scanner at 10 in./sec, and a maximum of 64 characters may be read from one document, the firm said.

Throughput is 50 document/min for a typical document with a maximum data rate of 3,200 char./min or 192,000 char./hour. Document size can run as large as six in. in height and nine in. in width.

The 720 operates concurrently with keyboard entry from up to 32 keystations into a 480 system.

An optional Audit Trail Printer will print up to 32 characters on the face of the document scanned.

While no special software is required for scanner operations, the standard validation and correction routines of the 480 can be applied to scanned input as well as key-entered data.

In operation, documents are batched and placed in an automatic feed hopper. If the scanner rejects a character which it is unable to read, two things happen:

- The rejected character is recorded as an "error flag" character.
- The document containing the rejected character is automatically routed to a reject hopper.

When the batched documents have been read, an operator uses a keystation to correct the rejected characters as they appear automatically on the CRT screen.

The cursor is automatically positioned over the rejected character, and the operator refers to the rejected documents for correction of the text, one keystroke per correction.

The firm is at 168 Middlesex Turnpike, 01803.

Singer Adds 110s

(Continued from Page 20)

drives that together provide 20M characters of storage.

Terminals for the four systems can be located up to 2,000 feet away from the processor. The systems can also be field-upgraded on site and the software is compatible with larger System Ten computers. A tape drive is also slated for introduction later this year, the firm said.

A business applications software package, the SPA system, is available with the 110s and supports order entry invoicing, finished forms invoicing, accounts receivable/payable, general ledger, payroll, inventory control and sales analysis. This package is priced at under $6,000. Singer RPG II is available for the 110-4 and 5.

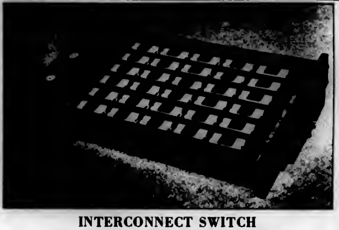
Deliveries of the smaller 110s will start this month and the larger 110-4 and 5 are scheduled for November.

Singer is also in the process of renaming the rest of the System Ten line into the 210, 310, 410, 510 and 610 series. Each series would be oriented toward specific user applications, the firm noted.

Singer is at 2350 Washington Ave., 94577.

Correction

Replacement ink rollers for the Univac 1710 verifier interpreter punch are priced at $5.95 each from Addressogrsph Multigraph Corp. at 1834 Walden Office Square, Schaumburg, Ill. 60172 [CW, July 17].



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The Interconnect Switch is a high density electronic switch that permits the interconnection of any two of 256 input points by supplying an address for each point. The 8 bit straight binary code address is supplied in parallel over 8 lines. The second address is supplied over the same 8 lines after latching the first address. Both addresses are latchable and resettable at any time. The solid state CMOS switches will pass analog data of amplitudes to 30 volts p to p and digital data of + or - 15 VDC. Analog frequencies up to 5 megahertz can be passed without waveform distortion. Addresses may be changed at a 2 megahertz rate. There is no channel to channel interaction or crosstalk. The device contains two independent store circuits including all control circuitry like latches, master resets, disable. Much flexibility exists within the device for other unique switching functions, i.e. any one of the 256 input connection points can be switched to a bus while another of the 256 points can be switched to another bus, with both busses accessible at the control connector. The device can also be used as a redundant 256 channel bidirectional Multiplexer or as a 256 channel differential Multiplexer, and many other possibilities exist. Compatible with most logic systems. Choice of pwr supplies from + or -10 to + or -15 VDC exists. The 256 input lines are terminated in a high density data connector (mating connector supplied. A 44 pin edge connector handles all control circuitry, power, etc. Typical power for the entire device during an active operation would be about 1/2 watt. The unit measures 1.75" wide by 7.9" high by 13" deep. Weight is 3 lbs. The unit mounts vertically. Any number of units may be mounted abreast of each other. The unit is priced at $2,600 with discounts available. Normally shipped from stock.

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Dijkstra invented it in 1965. IBM popularized it with the New York Times project in 1971. *Datamation* made it legitimate with their cover story article in December 1973 – structured programming and top-down program design have finally become officially recognized. Several programming projects have deomonstrated that structured programming can dramatically reduce development and testing time; one project experienced an average of only 1 bug per 10,000 lines of code. *What is structured programming?*

STRUCTURED PROGRAMMING CONCEPTS

This one-day course provides an intensive survey of the philosophy and ground rules behind structured programming. Using the major topics listed in the course outline, the student is offered a comprehensive overview of the development, uses and achievements of structured programming. FEE: $100.

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INSTRUCTORS

EDWARD YOURDON, an internationally recognized lecturer, author and consultant, has taught structured programming throughout the USA, Canada, Europe and Australia and has acted as both a consultant and a "chief programmer" on several structured programming projects. BOB ABBOTT is a 14-year veteran at Equitable Life and is currently Project Manager of an on-line IMS-based information retrieval system with over 12 million records.

YOURDON, Inc. and DELTAK, Inc. have co-developed a Multi-Media series of "in-house" Structured Programming courses. For details contact Pete Dignan, DELTAK, Inc., (312) 671-5300.

MAJOR TOPICS

1. Characteristics of a good program.
2. Top-Down Design - Basic concept. Contrast with bottom-up. Top-down coding, top-down testing.
3. Modular Programming - Techniques. Advantages and disadvantages.
4. History and Theory of Structured Programming - Definitions. Objectives. Basic building blocks.
5. Techniques of Structured Programming - Techniques for converting unstructured programs. Common extensions and compromises.
6. Practical Considerations - Application to major programming languages. Conventions. Efficiency considerations. Benefits.
7. Project Organization — Chief programmer teams. Superprogrammers. Ego-less programming.
8. Programming Style - Simplicity and clarity. Nested IFs. Additional techniques.
9. Defensive Programming - Basic concept. Techniques.

Bits & Pieces

Indeserv to Provide 3d-Party Maintenance

CONCORD, Mass. – Indeserv, Inc. has combined the capabilities and coverage of a number of independent regional service companies in the U.S. to provide nationwide or local third-party DP equipment maintenance under one contract, one pricing arrangement and one monthly bill.

Contracts with the association can be negotiated on a monthly or hourly basis. In addition to general field maintenance, the association does bench repair of components and modules, new installations and equipment moves, field changes, depot sparing and other maintenance support work.

Indeserv can be reached through P.O. Box 1241, 01742.

Drive Replaces DEC RK05

SCOTTSDALE, Ariz. – The Data Miser Model DM05 moving-head disk drive from International Memory Systems is a replacement for the DEC RK05 as a daisy chain expansion for DEC PDP-11 users with an RK11/RK05 combination.

The 60% less expensive drive stores 1.25M words and has an average access time of 35 msec with a track-to-track positioning time of 10 msec, according to the firm. The DM05 is compatible with standard DEC operating systems and is priced at $1,950 from the firm at 14609 Scottsdale Road, 85260.

Arm Controls Tape Winder

COMMACK, N.Y. – The 100 Series of tape winders from Robins Industries Corp. is available in various speeds ranging from 22- to 470 char./sec.

Metal reels up to 12 in. in diameter and up to 1 in. wide are available.

A tape-responsive operating arm controls operation, maintaining a constant tension to avoid pulling or tearing of tape. A delayed action feature, in which the arm moves in an arc before actuating a long-interval, on-off switch, results in even winding and reduces motor wear and tear, the firm said.

A special clutch release lets the reel freewheel for quick back referencing. Motors shut off automatically when there is no demand for tape, so the winders are suited to unattended operation, the firm added.

Prices range from $300 to $350, depending on speed, from the firm at 75 Austin Blvd., 11725.

'Testette' Tests Floppy Disk

PHOENIX – For $18,500, large users of floppy diskettes can buy the Testette Model 33 FD from the Three Phoenix Co. to test floppies for modulation, missing pulse and extra pulse.

Tests are made at singular, adjustable analog clipping levels and performed over 234 tracks. In the production test mode, when an error is encountered the certifier will abort the test automatically, return the carriage to home and indicate on the front panel the type of error detected. The device can also be used for diagnostic testing under manual control.

The firm is at 10632 N. 21st Ave., 85029.

CRT Glare Cut

ST. PAUL, Minn. – Users troubled with glare and reflections on their CRT displays can get a quick fix from 3M Co.

The 3M Light Control Film is available in thin sheets which contain closely spaced encapsulated microlouvers that work like tiny venetian blinds to enhance contrast, according to 3M. The film reduces glare, blocks unwanted light and directs viewing angles in light control applications. Colors and film surface options are available.

Priced at $15/sq ft, the minimum order is $25 from 3M, which can be reached through P.O. Box 33600, 55133.

3M film cuta CRT glare.

Interface Allows Direct Access To Tektronix, 21, 31 Calculators

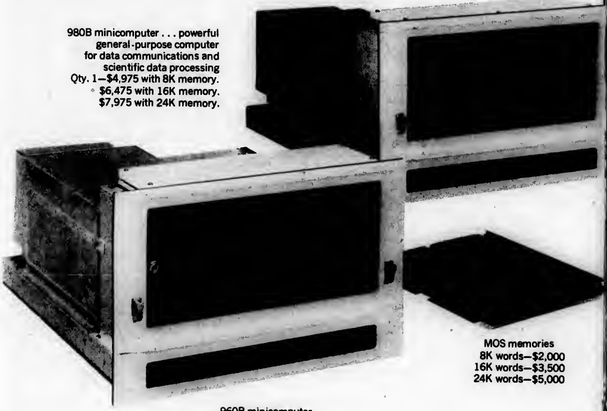
BEAVERTON, Ore. – The Tektronix 152 general-purpose BCD interface will allow users of the firm's 31 or 21 programmable calculators to have direct parallel access to the calculator's display register and to the internal memory

A calculator peripheral presents the data to the 152 interface in bit parallel, digit parallel format. The 152 then transfers the data to the calculator's display register in bit parallel, digit serial format.

When the Tektronix 31 calculator is in the direct memory access mode, the transfer of data can take place at up to 15,000 sample/sec. Data samples are processed after the transfer is completed.

The 152 can also translate the calculator's output to issue commands, as well as data, to the peripherals. The commands can be to start or stop as well as to execute certain remote operations. Information on data limits, ranges and frequencies can be passed on.

Price of the 152 interface is $1,150. The firm can be reached through P.O. Box 500, 97005.



TI announces four new computer products

980B minicomputer . . . powerful
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for data communications and
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Qty. 1—$4,975 with 8K memory.
$6,475 with 16K memory.
$7,975 with 24K memory.

MOS memories
8K words—$2,000
16K words—$3,500
24K words—$5,000

960B minicomputer . . .
process control computer
for manufacturing and testing systems
Qty. 1—$4,350 with 8K memory.
$5,850 with 16K memory.
$7,350 with 24K memory.

COM Saves User Time, Reduces Output, Paper Costs

FT. LAUDERDALE, Fla. – Switching to computer-output-microfilm (COM) has brought several benefits to Bendix's Avionics Division here: The division has recovered 80 hours of computer time monthly, reduced computer paper output requiring 65 feet of net filing depth to a stack of cassettes less than three ft tall, and eliminated more than $1,700 in paper form costs.

Substituting COM for paper also has enhanced manufacturing control by giving 10 material control coordinators individual desk-top viewers for microfilm retrieval in lieu of the former practice of walking up to half a block to a central reference library to search through binders of printouts.

The COM unit, a product of Memorex Corp., was interfaced to an IBM 360/30 at Bendix last year and switched to a 370/125 this spring.

A one-code change in the computer's operating system allows program applications to direct output to the COM unit instead of traditional impact printers.

The COM unit prints data directly onto microfilm in lines of up to 132 characters at speeds up to 10,000 line/min.

According to Steve Bridge, DP director at the Bendix facility, "Before COM our computer usage was approaching the limit – more than 600 hours monthly in a three shift, 24-hour operation. COM made available 80 extra hours to absorb additional workloads."

The improved throughput stems from the COM unit's output speed vs impact printers.

Lower Paper Costs

The reduction in paper form set costs alone more than absorbs the monthly rental for the Memorex COM. The bulk of previous paper output consisted of three-part form sets, which cost Bendix $17 per thousand at last year's prices. Total film costs now run $3.30 per 1,000 equivalent forms.

Eight-ounce cassettes contain the COM output. Each cassette contains 100 ft of film, the equivalent of 2,400 pages or 100 pounds of hard copy.

"Our current monthly output is equivalent to a stack of paper 65 ft tall. Now our cassettes consume less than three ft of filing depth," Bridge said.

The Bendix plant manufactures autopilots, navigational aids and weather radar, mostly for commercial aircraft. A weekly material requirements planning report, encompassing 35,000 individual parts, is contained in four cassettes.

Eighteen Stations

Eighteen reference stations throughout the factory, purchasing department, sales department and engineering department access the material requirements planning report to schedule material from vendors and into various stages of in-plant assembly. The previous report was limited to four copies because of legibility limitations of carbonized forms.

Another major use of COM involves records for the warranty department. Complete detail is available on film including serial numbers, name of part, dealer identification, type aircraft installed in, date bought, etc. Other COM-generated reports consist of marketing backlog records and various accounting reports.

Compuscan, Inc. Doubles Speed Of OCR System

TETERBORO, N.J. – Compuscan, Inc. has doubled the reading speed of its previous Alpha optical character recognition system, but only raised the price by one third. The Alpha II throughputs 120 char./sec and uses header sheets for programming.

A three-character display handles corrections and messages. The machine has a full Ascii keyboard and a format panel for selecting line spacing.

Alpha II outputs six-level punched paper tape and provides interfacing through an optional RS 232 communications modem. Other nonstandard interfaces are also available.

At the same time, the firm added more font reading capability including OCR-A and B, Courier-12, Perry and Prestige Elite in full alphanumeric versions.

The Alpha II is priced at $42,000 and additional fonts are under $2,500 from the firm at 900 Huyler St., 07608.

TC System Operates Foreground/Background

HOUSTON – An analog data acquisition system from TC Systems, Inc. uses dual Digital Equipment Corp. (DEC) PDP-8 computers and operates in a foreground/background mode to simultaneously accumulate and process information.

A 1.6M-word cartridge disk is standard and is shared by both computers. A wide-range analog input interface can be expanded to 64 analog channels, each with digital I/O capability. Up to eight I/O terminals may be connected for operator communication, program development or reporting.

Fortran IV and extended Basic can be used in developing programs under OS/8.

The system is priced from $60,000 to $80,000 from the firm at 3303 S. Rice Ave., 77027.

DS330 . . . low-cost, high-performance disc system for storage of up to 400 million bytes.

Processing Terminal System . . . much more than a system of intelligent terminals.

New price/performance standards!

900 Series Minicomputers
These two new additions to the TI computer line use memory featuring the new generation TI 4K RAM plug-in devices, error correction/detection logic and fault isolation indicator lights . . . achieving new standards in reliability and maintainability.

System architecture accommodates direct interfacing with high and low-speed devices, for a broad range of applications.

DS330
The new DS330 Disc System yields a dramatic increase in data storage capability previously not available in minicomputer systems. One to four drives per controller provides 100 to 400 million bytes of data storage.

Processing Terminal System
Ideal for data collection and retrieval systems, this versatile and expandable interactive terminal ensemble includes up to eight Model 913 CRT displays linked to a powerful controller/processor. The programmable keyboard provides instantaneous operator/terminal dialog, to achieve powerful operator prompting and dialog techniques that are impractical with other terminal systems. The Processing Terminal System's front-end processing ability relieves host computer loading.

These and all TI products and systems are backed by extensive user-oriented software, a nationwide sales and service network, and the TI-CARE* Computer Aided Repair Effort . . . the automated remote diagnostic and customer service dispatching system.

For more information on TI's new price/performance leaders, call your nearest sales office listed below. Or write Texas Instruments Incorporated,
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Info, Compcon, Wescon

September Has a Meeting for Everyone

The computer industry from coast to coast is gearing itself up for a busy second week in September highlighted by three major conferences – Info 74 in New York, Compcon 74 in Washington, D.C., and Wescon 74 in Los Angeles.

Applications, not technology, will be stressed at this year's Info 74, with the aim of showing corporate managers how systems can increase operating efficiency and at the same time increase the bottom line.

The conference, sponsored by the American Management Associations (AMA), will be held Sept. 9-12 at Lincoln Center, the Americana Hotel and the New York Coliseum.

In addition to considering information systems on a broad, horizontal basis, sessions will take a look at a series of vertical subjects, including manufacturing industries, merchandising and retailing, banking and finance, hospital administration, insurance, government, service industries, marketing and sales, administrative and office services and personnel.

The exposition being held in conjunction with the conference will take place in the Coliseum, where some 200 vendors will be on hand to exhibit data communications equipment, microform systems, peripheral devices, turnkey systems, software packages, services and telecommunications systems.

Registration for the full four-day conference is $100 for AMA members, $120 for nonmembers.

Further information is available from Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10010.

Compcon 74

Applications and design of microcomputers and minicomputers will be the focus at the IEEE Computer Society's Compcon 74, Sept. 10-12 at the Mayflower Hotel.

Societies/ User Groups

Sample sessions are "Business Applications of Minis," "Minis/Micros in Data Communication," "Procurement of Mini-Based Systems" and "Microprogrammed Minis."

There will also be sessions on software preparation for minis and micros, topics in mini/micro architecture and minicomputer applications in health care.

Some special interest topics scheduled for the conference are "Highlights of a Theoretical Study of Floating-Point Instructions" and "Text Editing with Magnetic Bubbles."

James Schoeffler of Case Western Reserve University will present a tutorial entitled "Minicomputer Real-Time Executives," Monday, Sept. 9.

Compcon registration is $60 for IEEE or Association for Computing Machinery members, $75 for nonmembers. Details on the conference are available from Compcon 74 Fall, P.O. Box 639 "B," Silver Spring, Md. 20901.

Wescon 74

Twenty-seven half-day sessions and a special evening exploration in "psychotronics" will take place at the Los Angeles Convention Center during Wescon, Sept. 10-13.

Topics for the four days range from "Microwave and Millimeter Solid-State Components" and "Advances in CCD Memories" to "The Real World of Digital Communications" and "The Microprocessor Revolution."

In addition to the sessions, Wescon features a 540-booth electronics exhibition.

Further information is available from Wescon at 3600 Wilshire Blvd., Los Angeles, Calif. 90010.

This unique seminar on Data Communications covers things that weren't even heard of a year ago.

Data Communications isn't just a complicated subject. It's a rapidly changing one. And our Data Communications seminar keeps on top of these changes like nothing else. We even provide you with free update materials for a full year after you complete the course.

Here are just some of the recent changes you'll learn about
- Synchronous Data Line Control (SDLC) - the principles of IBM's newly announced protocol and its implications to users
- HiD-LoD – Bell's newly effective tariff for voice lines.
- DDS- Bell's new all-digital data network--principles of operation and prices
- Newly approved major revisions to WATS
- Impact of Satellite Carriers and Specialized Carriers
- Value-added Carriers

We'll cover the field
Course topics include not only these recent changes, but a series of well-selected topics that will tell you how to go about effective data communications planning and implementation, including topics like:
- Intelligent terminals- performance and selection criteria
- Network software handlers- like CICS, Environs I, IMS and others
- Network organization and design. . . and much more.

You'll also learn how to save money
This course also includes a look at money-saving techniques, using such innovative concepts as:
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- Diagnostics for fault isolation
- Modem-sharing devices and digital bridges
- Remote multiplexers/concentrators
- Front-end prepocessors

Free reference materials and continuing updates
All participants in the seminar will keep the seminar workbook–a 2-volume loose-leaf outline of all course materials prepared by ICC Institute. You'll also receive a copy of "Data Modems Selection and Evaluation Guide" by Vess V. Vilips, and a "Data Communications and Teleprocessing Dictionary." *PLUS* you'll get free update materials for one year--just to keep you ahead of tomorrow's changes.

Dr. Dixon Doll leads Seminar
Dr. Dixon Doll, the highly respected teleprocessing consultant, leads the expert faculty at this seminar. Dr. Doll has his PhD in Systems Engineering from The University of Michigan, and many years of experience in this field as a consultant and educator. He has taught graduate level computer systems design, and has served as a professional consultant to such firms as IBM, Raytheon, ICC and MCI. Dr. Doll takes an active part in the entire seminar.

You should attend this seminar, if:
- You are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field.

- Your company will be going into this field in the near future.

Charges and Enrollment
The total cost for this two-day seminar is $350, including workbook, reference materials, year-long update service, luncheons and continental breakfasts. This does not include hotel rooms, if necessary.

To enroll, look over the schedule below, fill out the coupon and send it in. Remember, enrollment must be limited, so don't wait until it's too late.

Data Communications, the Executive Imperative
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Simulation Center Models Systems For Utilities

Allis-Chalmers has installed a hybrid computer network system simulation center to help analyze and solve utilities' generation and transmission system problems.

MILWAUKEE, Wis. – Learning by hard experience is as unwelcome a method for utility company engineers as it is for anyone else.

For years the utilities have been turning to analog computer simulations of their systems, or physical models of devices, to learn the limits of their systems and how their staffs can best handle crises.

Since April, however, Allis-Chalmers Corp., which manufactures equipment for the utilities, has been doing such simulations on a hybrid, analog and digital computer that the company said is much faster and more adaptable than the previous methods.

Dangers Predicted

Allis-Chalmers mathematically models the data the utility supplies, and with the results it is "able to predict if certain operating procedures are dangerous," said Robert W. Alford, marketing manager for the company's Power System Technologies Group.

The modeling also helps the utility learn ahead of time if it can take a certain countermeasure in the event of a particular problem, or whether the countermeasure would cause more problems – such as a "cascading blackout," Alford mentioned.

In the past, engineers at Allis-Chalmers and elsewhere used analog computers alone for these modeling techniques. But the setup process was very involved, with much of the changing of instruments done by hand, Alford noted.

Setup Process

With the hybrid system, he explained, the physical representation of the model goes on the hybrid computer's two Applied Dynamics AD4 and two Electronic Associates 231R analog modules. A Digital Equipment Corp. (DEC) PDP-11/45 automates much of the setup process and takes control of all the runs needed for a given case, Alford said.

Beyond this, it collects data and also controls a graphics CRT and a line printer which produces customer-ready reports.

The Allis-Chalmers facility can now do two or three studies in the time it took to do one, Alford said. And customers get their reports right away, instead of having to wait weeks or months for the staff to compile the data.

All Welcome

Customers pay for the computing time and engineering man-hour costs, Alford said. The customers do not have to be Allis-Chalmers users, he added.

In addition to the service to utilities, Alford said Allis-Chalmers uses the hybrid computer system to aid in designing its own equipment for use in the power industry.

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Learn What You Need to Know About Contracting for Computers and EDP Support Services - In One Hard Lesson

A two-and-a-half-day seminar that can help you protect your EDP investment--and your system.

Conducted by Roy N. Freed, the well-known expert in computer-related law, this unique seminar can give you the information you need to get good, effective contracts from the vendors that supply your EDP installation. And in an industry that's famous for its "promise them anything" attitude, this information can be invaluable. It can save you money. It can save you time. And, most important of all, it can help you protect your installation from disruptive discontinuities.

Here are some of the subjects covered in the seminar:

- The lease or purchase of computer systems.
- The lease or purchase of separate hardware or software.
- The purchase of time-sharing, data processing services and consultation.
- The use of facilities management.

And here are some of the things you'll learn:

- How to recognize opportunities to negotiate.
- How to establish goals and state conditions--before it's too late.
- How to place yourself in a strong bargaining position.
- How to insure on-time delivery of exactly what you've bargained for.
- How to reach an agreement that protects the security of confidential data.
- How to set reasonable performance standards for warranties.
- How to provide tax savings through proper wording of contracts.

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You'll also receive a valuable reference notebook which will back up the information you'll receive at this meeting. *The notebook will include sample vendor contract forms.*

Roy N. Freed, a leader in this field.

Roy Freed has specialized in computer-related legal matters for many years. He has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private practice with a prominent Boston law firm.

He has authored many articles on the various legal aspects of computers--including "Computer Frauds--A Management Trap" *(Business Horizons)* and a book entitled "Computers and Law--A Reference Work." Mr. Freed will personally conduct the entire seminar.

Should you attend this seminar?

If you're involved in the purchase of EDP equipment or services, the answer is a resounding "yes." Whether you're a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm, this seminar will pay for itself many times over. You just have to read the pages of *Computerworld* to realize how frequent supplier problems are--and how costly and disruptive they can be. This seminar can help you get what you want when you want it. It will help your company, your industry and you!

Times, places and cost

The Fall schedule includes three locations:

Sept. 25-27--Regency Hyatt Embarcadero, San Francisco
Oct. 23-25--St. Francis, New York
Dec. 4-6--Regency Hyatt O'Hare, Chicago

Total cost for the entire seminar, including the complete resource notebook, continental breakfasts, lunches and coffee breaks, is $295.00. Hotel rooms, if required, are not included.

Note: Enrollment must be strictly limited, and our other seminars were sold out. So don't wait until it's too late to enroll.

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The Graham Vow.

The Graham Vow expresses Graham Magnetics' pledge at a time when much of the computer tape industry strives for lower production cost through shortcut processing and testing.

- Graham has maintained and will enhance its program for increased excellence of product and high standards of Quality Assurance.
- Graham will take *no* shortcuts in manufacturing and testing of tape.
- Graham will *not* relax the stringent inspections and 100% certification which every reel of tape must pass before shipment.
- Graham will *not* delude you by compromising quality. On the contrary, Graham will enact even more exacting standards with the continuing development of new precision methods and techniques.

GRAHAM
MAGNETICS
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CRTs Reduce Error Rates For Phone Company Orders

MILWAUKEE, Wis. – An automated order entry system designed to catch clerical errors for correction before they enter the company's computerized data handling network is helping Wisconsin Telephone Co. here to service more than 500,000 customers more efficiently.

CRT terminals help reduce training time and costs while increasing order accuracy and flexibility.

When a customer requests a new phone, a move or a disconnect, for example, the service representative in one of the company's decentralized business offices notes the details on an order form. This form is passed on to the terminal operator there who keys the information into the system through a Sanders Associates CRT terminal.

The data is depicted on the screen where the information may be visually inspected, edited electronically and then sent to the computer. The computer verifies the order and, if an error has occurred, notifies the operator.

When the computer "clears" the order, it is automatically distributed to the commercial department, the Directory Division and the central DP department for billing.

The system also permits the operator to retrieve earlier orders and to add, delete, update or change any information and send it back to the computer for storage.

At present, the telephone company has approximately 60 video terminals serving six major metropolitan Milwaukee areas and plans to add an additional 60 terminals throughout the state to service its 1.5 million accounts.

The service order retrieval and distribution system central computer, an IBM 370/155, is controlled by a Sanders 720 data display system, which also serves as master terminal for the system. The terminal enabies operators to obtain instantaneous reports on all CRT lines throughout the state to determine their operational status. In addition, the terminal is used for testing new programs before they are sent to the fieid.

The utility has also installed Sanders Series 800 microprocessors in the centralized business order processing center, traffic intercept records center and directory records center.

Clerk in Milwaukee Talephone Business Office inputs order information.

ABA Studying Personal ID Methods

WASHINGTON, D.C. – In response to the rapid proliferation of bank card transactions, the American Bankers Association (ABA) has begun research in the area of personal identification techniques.

"This research will be directed toward methods to better assure that the individual presenting a plastic card issued by a bank is tha rightful owner of that bank card," said Thomas LaForge, chairman of the ABA's Personal Identification Subcommittee.

Personal identification techniques will be considered for use in point-of-sale terminal systems, bank teller systems, unattended automated tellers and other point-of-transaction iocations where bank cards are presented.

In addition, the group will be concerned with the acceptability of the verification procedures by the bank customer and the retail merchant, he said.

Any organization interested in participating in the study should contact Thomas LaForge, Bank of America, P.O. Box 37000, San Francisco, Calif. 94137.

Sharing Pays Off

ARNOLD AFS, Tenn. – Sharing is better, the Air Force Systems Command has found out.

Aerospace engineers at the Arnold Engineering Development Center (AEDC) here are accessing a CDC 6600 at the Armament Development and Test Center (ADTC) at Eglin Air Force Base, Fla.

AEDC is using the computer for a correlation study of wind tunnel data with actual flight test data, accessing the CPU for an hour each day via a remote terminal.

This arrangement, they stated, saves both time and money because the ADTC compnter can accept the program for this research in the form in which it is written – a form not compatible with AEDC's central computer, and it can process the large mass of data in much less time than would be required using the AEDC computer.

Mini Schedules Pipe Coatings

INVERGORDON, Scotland – At the new MK-Shand plant here, where pipe is coated with wire-reinforced concrete for use in carrying such materials as crude oil under the sea, a minicomputer is being used to schedule coating operations.

The Data General Nova 1220 is part of a system developed and installed for MK-Shand by Customer Computing Services Ltd. (CCSL) of Matlock, England.

The system makes calculations to assure that the pipe's weight, strength and dimensions are consistent and to establish a controlled negative buoyancy – in order to keep it on the ocean floor – when the pipe is submerged in depths of up to 420 feet.

Each step, from unloading to coating to shipping, is aided in some way by the minicomputer using a remote batch terminal in the MK-Shand plant, linkad via a Post Office Datel lina to the Nova system in CCSL's headquarters in England, according to Dr. Mike Fleming, CCSL managing director.

Data on steel pipes received, inciuding serial number, damage codes and other details, is sent to the computer through the remote terminal for comparison with the pipe supplier's shipping list.

According to Fleming, each pipe is measured for bare weight, circumference, length and out-of-round, and the computer then "provides the density and thickness of concrete to be applied."

After the pipe is coated with concrete, its new weight, circumference and the date it was coated are fed into the mini to generate a list of pipes coated on each shift.

The computer then specifies the depth of cut for each saw blade for the next step – cutting the joints.

After the joints are cut, the date of the cut is sent to the computer for calculating tha actual negative buoyancy of the compieted pipe sections.

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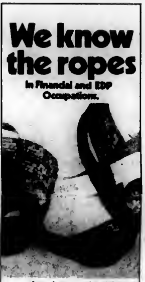

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We know who we are, what we've got, and where we're going with it. We always have. If we look new to you now, perhaps it's because you didn't know enough about us in the first place. We'll be happy to tell you anything else you'd like to know.

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COMPUTER INDUSTRY

CI Notes

Siemens Buys Telefunken Unit, Adds Large CPUs to Line

MUNICH – Siemens AG has enlarged its stake in the large systems market through the acquisition of Telefunken Computer GmbH from AEG Telefunken and Nixdorf Computer.

The new unit will operate under the name of Computergesellschaft Konstanz mbH and will produce, sell and service the TR4 and TR 440 systems.

Telefunken Computer was formed in 1972 under an arrangement whereby Telefunken and AEG would share in operating losses through 1973, which totaled $32.7 million, after which Nixdorf would share in supporting the losses.

Computergesellschaft has about $163.4 million of installed and on-order systems.

Observers expect it will eventually be brought into the Unidata group after its operations have been thoroughly integrated into Siemens.

Fujitsu to Make Model X

KAWASAKI, Japan – Plans for production of the Model X, jointly developed by Amdahl Corp. and Fujitsu, have shifted from the U.S. to Japan, and Fujitsu has scheduled first shipment of the system during the first part of next year.

Annual production of 30 systems is expected at Fujitsu's plant here, making Fujitsu one of the first DP firms in Japan to export computers to the U.S. on a regular basis, according to *EDP Japan Report.*

Perkin-Elmer, Interdata Merge

OCEANPORT, N.J. – The merger between The Perkin-Elmer Corp. and Interdata, Inc. has been approved by Interdata shareholders.

Under the terms of the agreement, 8/10ths of a share of Perkin-Elmer common stock will be exchanged for each share of Interdata common.

Interdata will operate as a wholly owned subsidiary of Perkin-Elmer under its present management.

Supershorts

Inforex, Inc. has shipped its 500th distributor system, a Model 1303, to Australian Datatronics Ltd.

– – –

Pansophic Systems, Inc. has formed a Canadian subsidiary, Pansophic Systems of Canada, Ltd.

– – –

MBI Data Processing has opened a new division, MBI-Support/3, to supply support services to IBM System/3 users.

– – –

NCR claims the number two position in total number of computer installations in Spain.

Rates Upset, Poor Competition

Bell Objects to Selective Competition

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Four representatives of the Bell System testified before the Senate Subcommittee on Antitrust and Monopoly that selective competition in the telecommunications industry would adversely affect the public interest, result in degradation of service and greater cost, and might retard the development of new technology.

Senior AT&T Vice-President Edward B. Crosland told the committee that if competition "is found to be in the public interest . . . Bell would compete fully and fairly."

However, he noted, competition must "be open and fair to all" and the government should not become a "giant handicapper" by allocating markets and protecting new competitors from the forces of a free market.

"Abandoning the principle of holding a single telephone company responsible for all aspects of service" could lead to a "profound and revolutionary change in traditional pricing patterns for telecommunications," he warned.

One result of selected competition would be a raise of about 75% in monthly bills for the basic residential rate, which currently is being subsidized by returns from business customers and other non-basic services, he said.

"Moreover, the introduction of facilities and services . . . with different standards of quality control and different arrangements for installations, maintenance and repair would undermine the coordination in planning and operating the network that has been vital to high-quality service," he said.

President of the long lines department Richard R. Hough outlined serious problems that can result from "uncontrolled interconnection of terminal devices to the nationwide communications network and when so-called specialized common carriers are allowed to interject their facilities into the network.

"Diseconomies, inefficiencies and poor service through construction of wastefully duplicative facilities, cartelization of the market, and fragmentation of responsibilities" for the planning and implementing of nationwide telecommunications service could result, he said.

Hough disputed what he called "speculation" by Clay T. Whitehead, director of the White House Office of Telecommunications Policy, that the separation of the long lines department from AT&T would not cause any major problems.

Whitehead's assessment was "wholly unrealistic" and "without factual foundation," he said.

William O. Baker, president of Bell Telephone Laboratories, noted that the lab's record for technological innovation thrives on the close bond to the operating telephone companies and Western Electric.

The Bell System's pressures for technological innovation "far exceed any alleged market stimulus, even for products such as terminal equipment," he added.

In addition, he noted that "unlike the general market quasicompetition, we have to live with what we do, and do not sell it and walk away . . ."

Baker cited testimony "that disintegration of the Bell System will destroy Bell Laboratories. The forceful professional competition, the stimulus of the insatiable demand and opportunity of the operating network for innovation, the personal excitement and commitment to see realized in honest technical terms – through the partnership of Western Electric – the actual manufacture and installation of new ideas, inventions, concepts – all of these will not survive dismemberment," he asserted.

Howard J. Trienens of the law firm of Sidley and Austin countered testimony of previous witnesses who proposed that the Bell System be broken up and restructured in the present model of the railroads.

He noted that just as the ICC would not permit railroads to counter motor carrier competition with lower rates, so is the FCC restricting Bell from using satellite technology in providing competitive rate adjustments.

5 Plaintiffs, IBM, Set Procedures To Expedite West Coast Trial

SAN FRANCISCO – Several procedural matters have been ironed out regarding conduct of the several antitrust suits filed by California firms against IBM. The moves are expected to expedite litigation.

The five plaintiffs – California Computer Products, Inc. (Calcomp), Memorex, Transamerica Computer Corp., Marshall Industries and Hudson General Corp. – have agreed with IBM to allow use of trial and discovery materials from other litigation, such as from suits against IBM brought by Telex Corp., Control Data Corp., Greyhound Computer Corp. and the Justice Department.

The parties also agreed to coordinate their discovery activities against IBM on common issues, but can proceed independently on matters not involving all five plaintiffs.

At a recent hearing here, Judge Ray McNichols directed counsel for Hudson General, Transamerica and IBM to meet and try to agree on a firm schedule for the completion of discoveries and recommend the trial date at the next hearing in about a month. Both Hudson and Transamerica had requested an early trial date for their cases because their claims are based largely on evidence in the Telex case.

McNichols granted Calcomp's motion to stay discovery on the IBM counterclaim that alleged Calcomp had infringed certain IBM patents.

However, he denied a second Calcomp motion to stay discovery on the IBM counterclaim that Calcomp had monopolized the digital plotter market.

European DP Medical Area to Soar

By Toni Wiseman
Of the CW Staff

LONDON – Health care is one of the largest and fastest growing sectors of the European computer systems and services market, according to a market study by Frost & Sullivan, Ltd., which predicted sales of $801 million for the period 1974-83.

This figure includes sales of $470 million to the UK, $132 million to West Germany, $122 million to France, $45 million to The Netherlands, $19 million to Sweden and $11 million to Switzerland.

Software development costs will at least equal hardware costs, but should reach five times the hardware costs by 1980, the report stated.

"European hospitals are in an enviable situation," Frost & Sullivan said. "They are not encumbered by old, unwritten-off equipment and programs performing functions inefficiently. Since most have no access to a computer at all, the hospitals can step right into the forefront of the 'state of the art.' "

IBM, the report noted, does not enjoy the same giant's share of the medical market as in other fields.

In the UK, for instance, Digital Equipment Corp. (DEC) has 17.2% of the units installed and IBM 6.45%. In The Netherlands, DEC boasts 30.7% as does Honeywell-Bull, while IBM has 19.1% of the units installed.

In terms of value of installed equipment, Univac is number one in the UK, The Netherlands and Sweden, with 17%, 27% and 60%, respectively.

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Leasco Aims to Broaden Communications Markets

GERMANTOWN, Md. – In order to "better reflect the concerns and needs of users," Leasco Response Terminals, Inc. has recently changed its name and signed two large orders with terminal vendors.

Under the new name of Leasco Data Communications Corp., the company will be going after a much broader market, according to Vice-President Carl English.

Leasco has signed a $5 million to $10 million expandable contract with General Electric and Lear Siegler, Inc. to distribute and maintain the GE Terminet and Lear Siegler ADM 1 and ADM 2.

Leasco bills itself as a full-range service or "one-step shopping" organization, designed to fit the average customer base, English said.

"In other words, Leasco is ready to supply the customer with everything he needs from one vendor, rather than forcing him to go to separate vendors for modems, terminal, maintenance, etc.," he said.

"The [Bell] Dataspeed 40 market is the one we're basically going after," English said.

He described the company's average customer as a Fortune 1000 company with 150 terminals, adding that it aims for users with a minimum of 50 terminals.

"We can't afford to send our salesmen out to call on the guy who only wants five terminals," English said. "Those are the people we try to reach through advertising. However, if they call us, we'll be glad to provide them with exactly what they want five, 10 or however many terminals they need."

Basically, the company provides terminal communications systems on a turnkey basis for lease.

Leasco has its own maintenance organization, with a nerve center at the firm's Bethesda, Md., headquarters, Arthur Gallo, national sales manager, said.

The service center is a data base which provides backup for field engineers, explained Gallo. "In other words, a customer can look over his entire computer network and find out how many terminals are down, how long they've been down and the mean time to recovery.

"We encourage our customers to use this data base as a management tool, to evaluate our performance among other things," Gallo said.

For the Birds

A pool in a courtyard outside the dining rooms at Univac has become home for Mama Mallard and her brood of eight. President Gerald G. Probst takes time out from the rigors of business to watch the new residents, named for Univac computers.

The new residents receive vitamin-enriched mash and a special ramp has been installed to hasten exits from the pool. The chlorine content of the pool is regulated.

An employee's petition temporarily quashed the idea of moving the new line of ducks to a more natural habitat.

Drug Wholesaler Sells Computers

MIAMI – A pharmaceutical wholesaler here recently took on a new product line – computers.

Broadmoor Pharmacy, Inc. has formed a subsidiary called Rosow Information Services that is a dealership for Basic/Four Corp. systems.

Elliott Rosow, who heads Broadmoor Pharmacy, has been in the pharmaceutical wholesaling and distribution business since World War II.

In 1968 he automated the firm's mail order business and quickly set about selling computer services to drug stores at the same time.

Rosow finds drug stores and computers thoroughly compatible. "Drug stores were among the first small businesses to make use of electronic data processing. The stores have always done extensive credit business and, therefore, had complex billing problems.

"Banks and pharmaceutical firms with extra space in their large computers have offered various accounting and billing services to their drug store clients for some years," he said.

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Contracts

SANTA ANA, Calif. – International Peripherals and Computer Corp. has signed a $250,000 contract with Forsythe McArthur Associates, Inc. for the sale of 6780 block multiplexer channels. Forsythe McArthur buys, sells and leases used 360s as well as new and used 370s. The 6780 enhances the 360 models 65, 67 and 75 with block multiplexing capability [CW, June 12].

Hewlett-Packard has received its first OEM contract for the HP-21MX minicomputer from Exploration Logging, Inc. The contract is for 35 HP-21M/20 minis, which will be incorporated into systems for monitoring oil drilling.

Chilton Corp. has been awarded an automation service contract by the Retail Merchants Association of San Antonio, Inc.

Computer Sciences Corp. has been awarded a contract by Los Angeles County to design an automated welfare system.

Incoterm Corp. has received a contract from Delta Airlines for $750,000 in intelligent terminal systems and services.

Plus Specialized Expertise

T/S Firms Offer Total Service Packages

By Nancy French
Of the CW Staff

NEWTON, Mass. – A trend among time-sharing companies today is to offer customers total service packages combined with expertise in specialized applications – and as many extra services as it takes to stay competitive.

Both On-Line Systems of Pittsburgh, Pa., and Keydata Corp. of Watertown, Mass., fit into this category despite basic differences in the services they offer.

On-Line offers a wide range of specific packages such as Olsims – a general management and information retrieval system; OLSFMS – a financial planning and forecasting system; Olsmop – a melt optimization package for the steel industry; and OLSPCS – a project control and resources allocation system.

Keydata, on the other hand, offers complete data processing services to companies in one particular type of business – manufacturing and distribution – and supplies everything from the terminal, at a monthly rental fee, to programs for all types of paperwork associated with manufacturing and distribution.

On-Line customers select and make their own lease arrangements for terminals.

As an added service to customers struggling to choose the right terminal, On-Line has begun sponsoring an annual terminal exhibit.

Scheduled for November 12-14 at the Pittsburgh Hilton Hotel, On-Line expects 35 to 50 vendors to display terminal gear that may be interfaced with the company's DEC systems.

An additional marketing effort adopted by On-Line this year has been the formation of a product marketing organization within the company's marketing services division "to set the tone and direction of our overall sales effort on a product-by-product basis," according to Michael P. LaVigna, divisional vice-president for On-Line.

Keydata Upgrade

Keydata, which provides terminals as part of its service, has recently upgraded to the General Electric Terminet, which can be operated at the standard 15- or 30 char./sec.

"With Keydata you operate on-line, for immediate processing, and results begin printing back in your office within two seconds," a spokesman said.

The Keydata system built around three Univac 494 CPUs, "responds immediately to your keyed information by printing, on the terminal in your office, the necessary documents to fill and ship an order as well as a finished invoice," he explained.

The system provides automatic notification of any exceptional conditions, such as items out of stock and customers who have exceeded credit limits, as well as status control of unfilled orders, management and accounting reports, accounts receivable control and regularly scheduled reports.

Univac's Probst Gets Added Post

NEW YORK – Gerald G. Probst, president of Univac, has been elected to the additional post of vice-president of Sperry Rand. Other corporate vice-presidents named recently include: Thomas Beaver Jr., corporate planning; Richard R. Mau, corporate communications; and Frank D. Sweeten, organization and management development.

Robert E. McDonald, president of Sperry Rand, was named to the additional position of chief operating officer.

Alfred J. Moccia was elected senior vice-president. He has been vice-president and chief financial officer since 1972.

Keydata Announces Donegan President

WATERTOWN, Mass. – L. Edwin Donegan Jr. has been named president and chief executive officer of Keydata Corp., following the resignation of President John T. Gilmore Jr. and two vice-presidents: Robert F. Lavin, marketing and sales, and Robert L. Rosbe Jr., finance and treasurer.

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Sperry Holders Urged to Support Inflation 'Cure'

NEW YORK – In the last two years Sperry Rand's revenues have increased 43% and earnings 84%, with a 20% rise in the book value per share. However, Chairman J. Paul Lyet lamented, the price of Sperry stock has failed to soar, due to the general decline in the stock market.

At Sperry's annual meeting, Lyet urged shareholders to let their elected representatives know if they favor measures that would stimulate the security markets, productivity and exports of U.S. products.

In seeking the support of shareholders, Lyet explained, "When a business manager talks to a politician, he listens politely; when thousands of stockholders and employees speak up, he listens attentively. If you favor measures which would stimulate the security markets, such as more favorable tax treatment of capital gains and dividends, let your representatives in Congress know about it – loudly and clearly," Lyet said.

"If you favor a balanced budget and steps to stimulate productivity in this country, which would be two giant steps to cure inflation, let your congressional representative know about it in no uncertain terms."

Similarly, "if you favor action which would stimulate exports of products made in the U.S. to create a favorable trade balance to avoid another dollar devaluation – speak up!"

In addition, Lyet urged stockholders who oppose legislation that would restrict foreign investment by U.S. companies and which would make foreign subsidiaries of U.S. companies noncompetitive in foreign markets to let their disagreement be known.

Lyet noted that if, in addition to Sperry's shareholders, other corporate heads would enlist their shareholders, perhaps something could be done about the external factors influencing the current business environment.

Pansophic's Luke Dies

OAK BROOK, Ill. – Warren W. Luke, vice-president and director of marketing for Pansophic Systems, Inc. died recently.

Luke, director of marketing since 1972, saw the firm's sales grow from $800,000 to nearly $3 million.

Orders & Installations

Purity Supreme Stores of N. Billerica, Mass., has installed a Datachecker electronic checkout system in its Nashua, N.H., store.

A Burroughs B3700 has been installed in Bexar County, Texas, where it maintains a complete property tax master file, with on-line cash collection, and assesses information on about 350,000 tax accounts.

Hahnemann Hospital and Medical College is installing Advanced Medical System Corp.'s Multilab and ADT systems.

Position Announcements

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Japan: Ken Suzuki. General Manager, Dempa/Computerworld, 1-11-15 Higashi Gotanda, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: Japan-26792.

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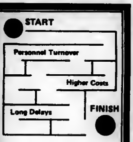

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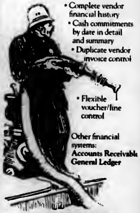

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DPF Reports $3.4 Million Loss for Year

HARTSDALE, N.Y. – DPF, Inc. reported a $3.4 million loss for the year, resulting from a $5.4 million write-off on the core memory portion of its 360 equipment portfolio.

Chairman Bertram Cohn noted that "on aggregate the firm appears approximately on target" for projections of the revenue yield by its portfolio as drawn up in 1971, when the firm took a $42.3 million write-down on the portfolio and converted to a break-even method of accounting.

Cohn said DPF's projections showed it would realize $5.4 million less than it had anticipated over the life of the equipment, until 1979, from its core memories.

With the write-down, DPF has valued its portfolio at 21% of original value as of last May 31. It is scheduled to reach a value of 7% as of that date in 1977, and 0% as of 1979.

"Independent memory manufacturers have come out with equipment that is drastically cheaper and more compact," Cohn observed, which impacted the value of the IBM core DPF had purchased as part of its 360 portfolio.

DPF has been fortunate in that it has been able to remarket the memory, but it has had to do so at prices below those used in its predictions three years ago, Cohn explained.

He noted there is a "wide trend among lessees to put more core on their 360s."

The loss for the year compares with earnings of $345,000 or 8 cents a share in 1973, when there was a special credit of $419,000.

Revenue for the year dipped to about $33 million from $33.9 million last year.

In the fourth quarter, the firm reported a loss of $4.4 million compared with $74,000 last year, when there was a special credit of $246,000. Revenue rose to $8.9 million from $8.2 million.

"Notwithstanding the special depreciation charge, the financial condition of the company was at the strongest level in years," Cohn said.

The firm's cash and short-term commercial paper holdings are up $1 million to $19.7 million. During the year the firm retired about $3.1 million of convertible debentures and reduced by $700,000 its secured and bank debt, which stands at $11.8 million, he said.

DPF had about 2.5% of its portfolio off-rent as of May 31, contrasted with about 3% a year ago.

Itel Produces Record Earnings; Greyhound Profit Nearly Halved

Two leasing companies displayed mixed fortunes in their second-quarter reports. Itel Corp. showed record earnings and revenues from continuing operations, while Greyhound Computer Corp.'s earnings were cut nearly in half from those in the 1973 second period, although revenues rose.

At Itel, all of the company's operating groups – financial services, transportation services, data services and data products – contributed to the firm's record performance, observed President Peter S. Redfield.

Earnings in the quarter rose to $2.4 million or 26 cents a share compared with $1.8 million or 20 cents a share in the same period last year, when there was a $700,000 tax credit.

Revenues jumped to $39.6 million from $21.1 million in the 1973 period.

The 1973 figures have been restated to reflect the discontinuance of certain businesses, as well as a change in accounting for investment tax credits, Itel said.

For the six months, the earnings trend also continued upward, reaching $4.5 million or 47 cents a share compared with $2.5 million or 29 cents a share in the year-ago first half. Revenues also jumped, to $69 million from $36 million last year.

Redfield expects the major portion of Itel's earnings to occur in the second half.

Greyhound Computer Corp.'s second-quarter earnings fell to $308,000 or 7 cents a share compared with $607,000 or 14 cents a share a year ago.

Revenues for the second period rose to $13.7 million from $10.8 million last year. For the six months, they grew to $26.5 million from $21.3 million.

Six-month earnings dropped to $746,000 or 17 cents a share compared with $1.2 million or 29 cents a share in the year-ago period.

Modcomp Sets Record In Sales, Earnings

FORT LAUDERDALE, Fla. – Modular Computer Systems (Modcomp) scored record sales and earnings for the second quarter ended June 28. Earnings for the six months doubled over those of a year ago.

Although there was no special credit in the quarter, earnings climbed to $485,000 or 18 cents a share compared with $304,000 or 15 cents a share in the same 1973 period when there was a $142,000 special credit.

Revenues more than doubled to $6.1 million from $2.8 million last year.

In the six months, earnings jumped to $1.1 million or 39 cents a share compared with $556,000 or 27 cents a share in the year-ago period.

CIG Gets $40 Million In Loans, Credits

STAMFORD, Conn. – "We believe the market for computer hardware will grow annually at a 15% to 20% compounded rate," observed Carl H. Freyer, president of Computer Investors Group, Inc. (CIG).

To be prepared for the growth, CIG has reaped $40 million in loans and credits from two banks to refinance existing debt and to purchase computer equipment.

An agreement with First National City Bank (FNCB), New York, and National Bank of North America involves a term loan and revolving credit line totaling $30 million for U.S. operations. CIG has already borrowed $24 million and used about $19 million to refinance debt and $5 million for purchase of equipment.

The second agreement, with FNCB, London, is a $10 million credit line available to purchase 370s and related equipment for installation in West Germany.

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Earnings Reports

MSI OATA
Three Months Ended June 29

	1974	1973
Shr Ernd	$.16	$.11
Revenue	7,545,765	4,173,000
Earnings	318,686	212,415

COMPUGRAPHIC
Three Months Ended Juna 30

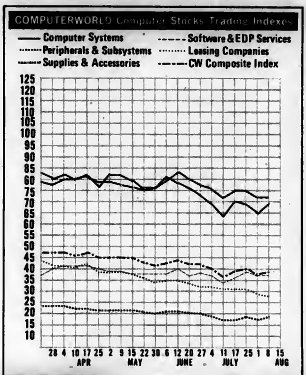
	1974	1973
Shr Ernd	$.70	$.52
Revenue	18,879,000	11,880,000
Earnings	1,289,000	955,000
9 Mo Shr	1.96	1.36
Revenue	45,848,000	33,762,000
Earnings	3,603,000	2,489,000

RAPIDATA
Three Months Ended June 30

	1974	1973
Shr Ernd	$.05	$.11
Revenue	2,763,866	2,248,191
Earnings	91,342	206,901
6 Mo Shr	.09	.27
Revenua	5,450,863	4,552,721
Earnings	171,907	498,284

ENNIS BUSINESS FORMS
Three Months Ended Mey 31

	1974	1973
Shr Ernd	$.40	$.19
Revenue	15,113,179	11,610,390
Earnings	930,228	451,004



BARRY WRIGHT
Three Months Ended Juna 30

	1974	1973
Shr Ernd	$.30	$.31
Revenua	11,780,215	9,882,984
Spec Cred	.....	a64,033
Earnings	482,643	508,412
6 Mo Shr	.54	.54
Revenue	22,751,504	18,943,002
Spec Crad	.....	a64,033
Earnings	677,518	888,497

a-From sala of land.

NCR
Three Months Ended June 30

	1974	1973
Shr Ernd	$.81	$.68
Revenue	477,256,000	433,416,000
aEarnings	19,847,000	13,357,000
6 Mo Shr	1.32	.90
Revenue	864,509,000	800,808,000
aEarnings	31,901,000	20,814,000

a-Includes $750,000 gain from sale of limberlands in 1974 and $900,000 gain from sale of a micropublishing operation in 1973.

CINCINNATI MILACRON
Three Months Ended June 15

	1974	1973
Shr Ernd	a$1.13	$.61
Revenue	103,863,040	86,105,462
Earnings	a4,125,300	2,265,019
6 Mo Shr	a1.75	1.16
Revenua	205,604,017	166,426,339
Earnings	a6,422,722	4,309,334

a-Includes after-tax gain from sale of assets of the Advanced Division of Cincinnati Milacron Chemicals, Inc.

CONRAC
Three Months Ended Juna 30

	1974	1973
Shr Ernd	$.60	$.50
Revenue	20,853,000	17,076,000
Earnings	790,000	673,000
6 Mo Shr	1.17	.95
Revenue	41,143,000	32,966,000
Earnings	1,556,000	1,281,000

OATA PRODUCTS
Three Months Ended June 29

	1974	1973
Shr Ernd	$.20	$.25
Revenue	23,431,000	18,677,000
Tex Cred	.....	616,000
Earnings	1,361,000	1,710,000

DICOMED
Six Months Ended June 30

	1974	1973
Shr Ernd	$.14	$.11
Revenue	747,475	582,591
Earnings	67,527	50,502

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Computerworld Stock Trading Summary

All statistics compiled; computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTEP SYSTEMS

EXCH		1973-74 RANGE (1)	CLOSE AUG 8 1974	WEEK NET CHNGE	WEEK PCT CHNGE
N	RURPOUHS CORP	49-126	91 3/8	+1 3/8	+1.5
N	COLLINS RADIO	16- 24	24 3/4	0	0.0
O	COMPUTEP AUTOMATION	5- 20	10 3/4	+ 1/8	+1.1
N	CONTPOL DATA CORP	20- 62	22 7/8	+2 5/8	+12.9
N	DATA GENEPAL CORP	22- 48	24 1/2	+1 1/2	+6.5
O	DATAPOINT CORP	8- 21	10 1/4	+ 3/4	+7.8
O	DIGITAL COMP CONTROL	2- 6	2 3/8	+ 1/8	+5.8
N	DIGITAL EQUIPMENT	73-121	92 1/2	+4	+4.5
N	ELECTPONIC ASSOC.	2- 9	8	+ 1/8	+0.6
A	ELECTRONIC ENGINEEP.	6- 14	7 7/8	+ 1/8	+1.8
N	FOKRORO	23- 48	27 3/8	+ 7/8	+3.3
O	GENERAL AUTOMATION	22- 55	27 1/2	+1 1/4	+4.7
O	GRI COMPUTER CORP	1- 3	5/8	0	0.0
N	HEWLETT-PACKARD CO	78- 88	78 1/2	+2 7/8	+3.9
N	HONEYWELL INC	37-139	42 5/8	+3 3/8	+8.5
N	IBM	198-348	208 1/2	+6 7/8	+3.4
O	INTERDATA INC	7- 22	18	- 1/4	-1.2
O	MICRODATA CORP	2- 10	4 1/8	0	0.0
N	NCP	27- 46	30 7/8	+1 1/2	+5.1
N	RAYTHEON CO	22- 39	30 1/4	+3 1/4	+12.0
N	SINGER CO	24- 74	27 7/8	+3 3/8	+13.7
N	SPERRY PAND	33- 56	34	+ 7/8	+8.6
A	SYSTEMS ENG. LABS	1- 8	1 7/8	+ 1/4	+15.3
N	TEXAS INSTRUMENTS	80-132	80 1/4	-2 3/8	-2.8
O	ULTIMACC SYSTEMS INC	1- 11	1 1/2	- 1/4	-14.2
N	VARIAN ASSOCIATES	7- 20	8 7/8	+1 1/4	+16.3
N	WANG LAPS.	18- 34	11 7/8	+1 3/8	+13.0
N	XEROX CORP	93-169	95 1/4	+ 7/8	+0.9

LEASING COMPANIES

EXCH		1973-74 RANGE (1)	CLOSE AUG 8 1974	WEEK NET CHNGE	WEEK PCT CHNGE
A	POOTHE COMPUTEP	1- 5	1 1/8	0	0.0
O	BRESNAHAM COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	2- 17	2	- 3/4	-27.2
A	COMMERCE GROUP CORP	3- 6	3	0	0.0
O	COMPUTER EXCHANGE	1- 1	1/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	1 1/4	0	0.0
O	COMP. INSTALLATIONS	1- 2	1/4	0	0.0
M	DATRONIC RENTAL	1- 3	3/4	0	0.0
A	DCL INC	0- 3	3/8	0	0.0
N	DRF INC	3- 9	2 7/8	+ 1/4	+9.5
O	EDP RESOURCES	1- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 6	1 7/8	- 1/8	-6.2
A	GREYHOUND COMPUTER	3- 6	3 1/2	- 1/4	-7.4
A	ITEL	4- 12	4 3/8	+ 1/4	+6.0
N	LEASCO CORP	5- 12	8 5/8	0	0.0
O	LEASPAC CORP	1- 8	3/4	0	0.0
O	LECTRO MGT INC	1- 2	1/8	- 1/8	-50.0
O	NRG INC	2- 15	2 1/8	- 1/8	-5.5
A	PIONEER TEX CORP	2- 10	2 3/4	0	0.0
A	ROCKWOOD COMPUTEP	1- 3	7/8	+	+7.6
N	U.S. LEASING	8- 36	7 5/4	-1 7/8	-19.4

FXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWAPE & EDP SERVICES

EXCH		1973-74 RANGE (1)	CLOSE AUG 8 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	0	0.0
A	APPLIED DATA RES.	2- 4	2	+ 1/4	+14.2
O	APPLIED LOGIC	1- 3	1/8	0	0.0
N	AUTOMATIC DATA PROC	21- 94	27 1/4	+1 3/8	+5.3
O	BRANDON APPLIED SYST	1- 1	3/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 9	4 1/4	0	0.0
O	COMPUTEP DIMENSIONS	1- 5	1 1/2	0	0.0
O	COMPUTER HORIZONS	1- 6	1 1/2	0	0.0
O	COMPUTEP NETWORK	1- 5	1 1/4	0	0.0
N	COMPUTEP SCIENCES	2- 6	2 5/8	0	0.0
O	COMPUTEP TASK GROUP	1- 2	1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1/2	0	0.0
O	COMPUTEP USAGE	2- 8	2 3/4	+ 1/8	+4.7
O	COMPESS	1- 2	3/8	0	0.0
O	COMSHAPE	2- 8	2 1/2	0	0.0
N	CORDURA CORP	2- 15	2 1/4	- 1/8	-5.2
O	DATATAR	1- 4	1 5/8	- 1/8	-7.1
A	ELECT COMP PROG	1- 2	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 58	17 1/4	- 7/8	-4.8
O	INFONATIONAL INC	1- 2	1/2	0	0.0
O	I.O.A. DATA CORP	1- 1	3/8	0	0.0
O	IPS COMPUTEP MARKET.	1- 5	3/4	0	0.0
O	KEANE ASSOCIATES	2- 5	2 1/2	- 1/4	-9.0
O	KEYDATA CORP	2- 12	2	- 1/2	-20.0
O	LOGICON	2- 7	3 1/4	- 1/8	-3.7
A	MANAGEMENT DATA	1- 5	1 3/8	0	0.0
O	NATIONAL CSS INC	18- 42	13 1/2	+2	+17.3
O	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
O	NATIONAL INFO SPVCS	1- 2	1/2	0	0.0
A	ON LINE SYSTEMS INC	12- 31	23 1/2	0	0.0
N	PLANNING RESEARCH	2- 7	2 1/2	+ 1/4	+11.1
O	PROGRAMMING METHODS	17- 25	17	0	0.0
O	PROGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	2- 24	2 1/8	- 1/8	-5.5
O	SCIENTIFIC COMPUTERS	1- 3	7/8	0	0.0
O	SIMPLICITY COMPUTER	1- 4	3/4	- 3/8	-33.3
O	TCC INC	1- 1	3/8	- 1/8	-25.0
O	TYMSHAPE INC	6- 13	8 1/4	+ 1/4	+2.7
O	UNITED DATA CENTER	2- 6	3 1/4	+1 1/4	+62.5
A	URS SYSTEMS	2- 8	2 3/8	+ 1/2	+20.6
N	WTLY CORP	3- 11	2 5/8	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1973-74 RANGE (1)	CLOSE AUG 8 1974	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	5- 34	6 3/8	+ 7/8	+15.9
O	ADVANCED MEMORY SYS	2- 23	2 3/8	- 1/8	-5.0
N	AMPES CORP	3- 7	3 1/2	+ 1/8	+3.7
O	ANDERSON JACOBSON	8- 6	8 1/4	+ 1/4	+12.5
O	BEEHIVE MEDICAL ELEC	2- 10	8 1/2	0	0.0
A	BOLT,BERANEK & NEW	6- 12	7 1/4	+ 3/8	+5.4
N	BUNKER-RAMO	5- 18	5 1/2	+ 3/8	+7.3
A	CALCOMP	5- 16	8 1/4	+ 3/4	+10.0
O	CAMBRIDGE MEMORIES	7- 17	8 3/4	0	0.0
O	CENTRONICS DATA COMP	12- 38	13 1/4	+ 3/4	+6.0
O	CODEX CORP	8- 19	14 3/4	+2 3/4	+22.8
O	COGNITRONICS	1- 3	7/8	0	0.0
O	COMPUTEP COMMUN.	1- 4	1	+ 1/2	+100.0
A	COMPUTER EQUIPMENT	1- 3	1 3/8	+ 1/8	+10.0
O	COMPUTER MACHINERY	2- 13	4 1/4	+1 1/8	+36.0
O	COMPUTEP TRANSCEIVEP	1- 6	1	0	0.0
N	CONRAC CORP	13- 32	15 1/4	+1 1/8	+7.8
O	DATA ACCESS SYSTEMS	1- 3	2 1/2	0	0.0
O	DATA 100	7- 19	8 1/2	- 1/8	-1.4
A	DATA PRODUCTS CORP	2- 5	3 3/4	+ 1/4	+7.1
O	DATA RECOGNITION	1- 3	1/4	0	0.0
O	DATA TECHNOLOGY	1- 5	2 5/8	+ 1/8	+5.0
O	DECISION DATA COMPUT	4- 40	5 7/8	+ 1/8	+2.1
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
O	DI/AN CONTROLS	1- 4	3/8	- 1/8	-25.0
N	ELECTRONIC M & M	2- 6	2 1/2	0	0.0
O	FABRI-TEK	2- 5	1 7/8	+ 1/8	+7.1
O	GENERAL COMPUTER SYS	2- 8	1 3/4	0	0.0
N	GENERAL ELECTPIC	43- 76	46 1/8	+3 1/8	+7.2
N	HAZELTINE CORP	4- 9	4	- 1/8	-3.0
O	INFOREX INC	2- 23	3	+ 1/4	+9.0
O	INFORMATION DISPLAYS	1- 2	1/2	0	0.0
O	INFORMATION INTL INC	8- 15	9 3/4	+ 3/4	+8.3
A	LUNDY ELECTRONICS	3- 8	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/8	0	0.0
N	MEMOREX	2- 18	3 3/4	0	0.0
A	MILGO ELECTRONICS	9- 28	10 7/8	+ 7/8	+8.7
N	MOHAWK DATA SCI	2- 13	2 1/4	0	0.0
O	ODEC COMPUTER SYST.	2- 6	1 1/2	0	0.0
O	OPTICAL SCANNING	2- 8	3 1/4	+ 1/4	+8.3
O	PERTEC CORP	3- 8	3	+ 1/4	+9.0
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	2- 9	2	- 3/8	-15.7
O	PRECISION INST.	2- 6	3/4	0	0.0
O	QUANTOR CORP	3- 10	2 3/4	- 1/2	-15.3
O	RECOGNITION EQUIP	2- 8	2 3/4	+ 1/4	+10.0
N	SANDERS ASSOCIATES	3- 12	3 5/8	0	0.0
O	SCAN DATA	1- 6	1 3/8	+ 1/4	+22.2
O	STORAGE TECHNOLOGY	9- 34	10 3/4	+1 1/8	+11.8
O	STCOR INC	7- 20	7 3/4	+ 1/4	+3.3
O	TALLY CORP.	2- 14	2 1/8	+ 1/8	+6.2
O	TEC INC	3- 8	3 1/4	- 1/4	-7.1
N	TEKTRONIX INC	27- 55	29 5/8	+1 1/8	+3.9
N	TELEX	3- 8	3 5/8	+1	+38.0
O	WANGCO INC	7- 13	7 7/8	0	0.0
O	WILTEK INC	3- 18	3 1/2	+ 1/4	+7.6

SUPPLIES & ACCESSORIES

EXCH		1973-74 RANGE (1)	CLOSE AUG 8 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	4- 8	4 3/4	0	0.0
A	BARRY WRIGHT	5- 13	5 1/4	0	0.0
O	CYBERMATICS INC	1- 3	1	- 1/8	-11.1
A	DATA DOCUMENTS	17- 54	37 1/2	- 1/2	-1.3
O	DUPLEX PRODUCTS INC	6- 17	13	+ 3/8	+2.9
N	ENNIS BUS. FORMS	5- 8	5 7/8	+ 1/4	+4.4
O	GRAHAM MAGNETICS	6- 20	7	- 1/2	-6.6
O	GRAPHIC CONTROLS	7- 12	9 1/4	0	0.0
N	3M COMPANY	85- 91	67 3/8	+2 3/8	+3.6
O	MOORE CORP LTD	48- 65	49 1/4	-2	-3.8
N	NASHUA CORP	32- 58	36	+ 1/2	+1.4
O	REYNOLDS & REYNOLDS	11- 51	13	0	0.0
O	STANDARD REGISTER	11- 20	13	- 1/2	-3.7
O	TAB PRODUCTS CO	6- 23	5 3/4	0	0.0
N	UARCO	15- 23	21 1/4	+1 3/4	+8.9
A	WABASH MAGNETICS	5- 8	4 7/8	- 1/8	-2.5
N	WALLACE BUS FORMS	14- 26	19 7/8	+1 3/4	+9.6

$51,238
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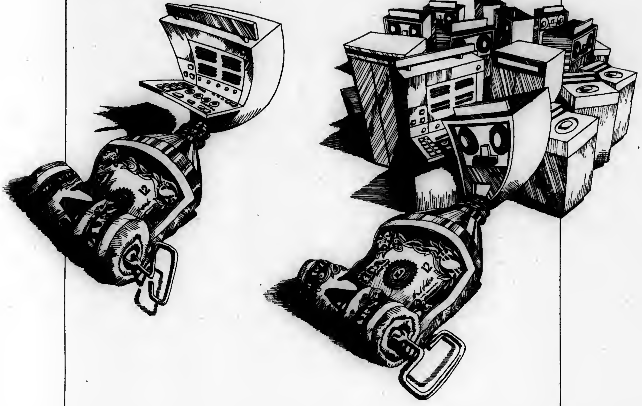

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